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CONTENTS.

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THE PSYCHOLOGICAL REVIEW.

INTERPRETATION OF SAVAGE MIND.

BY PROFESSOR JOHN DEWEY,
The University of Chicago.

The psychical attitudes and traits of the savage are more than stages through which mind has passed, leaving them behind. They are outgrowths which have entered decisively into further evolution, and as such form an integral part of the framework of present mental organization. Such positive significance is commonly attributed, in theory at least, to animal mind; but the mental structure of the savage, which presumably has an even greater relevancy for genetic psychology, is strangely neglected.

The cause of this neglect I believe lies in the scant results so far secured, because of the abuse of the comparative method—which abuse in turn is due to the lack of a proper method of interpretation. Comparison as currently employed is defective—even perverse—in at least three respects. In the first place, it is used indiscriminately and arbitrarily. Facts are torn loose from their context in social and natural environment and heaped miscellaneously together, because they have impressed the observer as alike in some respect. Upon a single page of Spencer,[1] which I chanced to open in looking for an illustration of this point, appear Kamschadales, Kirghiz, Bedouins, East Africans, Bechuanas, Damaras, Hottentots, Malays, Papuans, Fijians, Andamanese—all cited in reference to establishing a certain common property of primitive minds. What would we think of a biologist who appealed successively to some external charac-

[1] 'Sociology,' I., p. 57.

teristic of say snake, butterfly, elephant, oyster and robin in support of a statement? And yet the peoples mentioned present widely remote cultural resources, varied environments and distinctive institutions. What is the scientific value of a proposition thus arrived at?

In the second place, this haphazard, uncontrollable selection yields only static facts—facts which lack the dynamic quality necessary to a genetic consideration. The following is a summary of Mr. Spencer's characterizations of primitive man, emotional and intellectual:

He is explosive and chaotic in feeling, improvident, childishly mirthful, intolerant of restraint, with but small flow of altruistic feeling,[1] attentive to meaningless detail and incapable of selecting the facts from which conclusions may be drawn, with feeble grasp of thought, incapable of rational surprise, incurious, lacking in ingenuity and constructive imagination.[2] Even the one quality which is stated positively, namely, keenness of perception, is interpreted in a purely negative way, as a character antagonistic to reflective development. "In proportion as the mental energies go out in restless perception, they cannot go out in deliberate thought."[3] And this from a sensationalist in psychology!

Such descriptions as these also bear out my first point. Mr. Spencer himself admits frequent and marked discrepancies (*e. g.*, pp. 56, 59, 62, 65, etc.), and it would not be difficult to bring together a considerable mass of proof-texts to support the exact opposite of each of his assertions. But my point here is that present civilized mind is virtually taken as a standard, and savage mind is measured off on this fixed scale.

It is no wonder that the outcome is negative; that primitive mind is described in terms of 'lack,' 'absence': its traits are incapacities. Qualities defined in such fashion are surely useless in suggesting, to say nothing of determining, progress, and are correspondingly infertile for genetic psychology, which is interested in becoming, growth, development.

[1] *Ibid.*, pp. 59, 60, 63, 69, 71.
[2] *Ibid.*, pp. 79, 82, 85–87.
[3] *Ibid.*, p. 77.

The third remark is that the results thus reached, even passing them as correct, yield only loose aggregates of unrelated traits—not a coherent scheme of mind. We do not escape from an inorganic conglomerate conception of mind by just abusing the 'faculty' psychology. Our standpoint must be more positive. We must recognize that mind has a pattern, a scheme of arrangement in its constituent elements, and that it is the business of a serious comparative psychology to exhibit these patterns, forms or types in detail. By such terms, I do not mean anything metaphysical; I mean to indicate the necessity of a conception such as is a commonplace with the zoölogist. Terms like articulate or vertebrate, carnivor or herbivor, are 'pattern' terms of the sort intended. They imply that an animal is something more than a random composite of isolated parts, made by taking an eye here, an ear there, a set of teeth somewhere else. They signify that the constituent elements are arranged in a certain way; that in being co-adapted to the dominant functions of the organism they are of necessity co-related with one another. Genetic psychology of mind will advance only as it discovers and specifies generic forms or patterns of this sort in psychic morphology.

It is a method for the determination of such types that I wish to suggest in this paper. The biological point of view commits us to the conviction that mind, whatever else it may be, is at least an organ of service for the control of environment in relation to the ends of the life process.

If we search in any social group for the special functions to which mind is thus relative, occupations at once suggest themselves.[1] Occupations determine the fundamental modes of activity, and hence control the formation and use of habits. These habits, in turn, are something more than practical and overt. 'Apperceptive masses' and associational tracts of necessity conform to the dominant activities. The occupations determine the chief modes of satisfaction, the standards of suc-

[1] We might almost say, in the converse direction, that biological genera are 'occupational' classifications. They connote different ways of getting a living with the different instrumentalities (organs) appropriate to them, and the different associative relations set up by them.

cess and failure. Hence they furnish the working classifications and definitions of value; they control the desire processes. Moreover, they decide the sets of objects and relations that are important, and thereby provide the content or material of attention, and the qualities that are interestingly significant. The directions given to mental life thereby extend to emotional and intellectual characteristics. So fundamental and pervasive is the group of occupational activities that it affords the scheme or pattern of the structural organization of mental traits. Occupations integrate special elements into a functioning whole.

Because the hunting life differs from, say, the agricultural, in the sort of satisfactions and ends it furnishes, in the objects to which it requires attention, in the problems it sets for reflection and deliberation, as well as in the psycho-physic coördinations it stimulates and selects, we may well speak, and without metaphor, of the hunting psychosis or mental type. And so of the pastoral, the military, the trading, the manually productive (or manufacturing) occupations and so on. As a specific illustration of the standpoint and method, I shall take the hunting vocation, and that as carried on by the Australian aborigines. I shall try first to describe its chief distinguishing marks; and then to show how the mental pattern developed is carried over into various activities, customs and products, which on their face have nothing to do with the hunting life. If a controlling influence of this sort can be made out—if it can be shown that art, war, marriage, etc., tend to be psychologically assimilated to the pattern developed in the hunting vocation, we shall thereby get an important method for the interpretation of social institutions and cultural resources—a psychological method for sociology.

The Australian lives in an environment upon the whole benign, without intense or violent unfavorable exhibition of natural forces (save in alternations of drought and flood in some portions), not made dangerous by beasts of prey, and with a sufficient supply of food to maintain small groups in a good state of nutrition though not abundant enough to do this without continual change of abode. The tribes had no cultivated plants, no

domesticated animals (save the dingo dog), hence no beasts of burden, and no knowledge or use of metals.[1]

Now as to the psychic pattern formed under such circumstances. How are the sensory-motor coördinations common to all men organized, how stimulated and inhibited into relatively permanent psychic habits, through the activities appropriate to such a situation?

By the nature of the case, food and sex stimuli are the most exigent of all excitants to psycho-physic activity, and the interests connected with them are the most intense and persistent. But with civilized man, all sorts of intermediate terms come in between the stimulus and the overt act, and between the overt act and the final satisfaction. Man no longer defines his end to be the satisfaction of hunger as such. It is so complicated and loaded with all kinds of technical activities, associations, deliberations and social divisions of labor, that conscious attention and interest are in the process and its content. Even in the crudest agriculture, means are developed to the point where they demand attention on their own account, and control the formation and use of habits to such an extent that they are the central interests, while the food process and enjoyment as such is incidental and occasional.

The gathering and saving of seed, preparing the ground, sowing, tending, weeding, care of cattle, making of improvements, continued observation of times and seasons engage thought and direct action. In a word, in all post-hunting situations the end is mentally apprehended and appreciated not as food satisfaction, but as a continuously ordered series of activities and of objective contents pertaining to them. And hence the direct and personal display of energy, personal putting forth of effort, personal acquisition and use of skill are not conceived

[1] All these points are important, for the general hunting psychosis exhibits marked differentiations when developed in relation to ferocious beasts; in relation to a very sparse or very abundant food supply; in relation to violently hostile natural forces; and when hunting is pursued in connection with various degrees of agriculture or domesticated herds or flocks. For economy of space, I have omitted reference to the few portions of Australia where the food supply (generally fish in such circumstances) is sufficiently abundant to permit quasi-permanent abodes, though the psychological variations thus induced are interesting.

or felt as immediate parts of the food process. But the exact contrary is the case in hunting. There are no intermediate appliances, no adjustment of means to remote ends, no postponements of satisfaction, no transfer of interest and attention over to a complex system of acts and objects. Want, effort, skill and satisfaction stand in the closest relations to one another. The ultimate aim and the urgent concern of the moment are identical; memory of the past and hope for the future meet and are lost in the stress of the present problem; tools, implements, weapons are not mechanical and objective means, but are part of the present activity, organic parts of personal skill and effort. The land is not a means to a result but an intimate and fused portion of life—a matter not of objective inspection and analysis, but of affectionate and sympathetic regard. The making of weapons is felt as a part of the exciting use of them. Plants and animals are not 'things,' but are factors in the display of energy and form the contents of most intense satisfactions. The 'animism' of primitive mind is a necessary expression of the immediacy of relation existing between want, overt activity, that which affords satisfaction and the attained satisfaction itself. Only when things are treated simply as *means*, are marked off and held off against remote ends, do they become 'objects.'

Such immediacy of interest, attention and deed is the essential trait of the nomad hunter. He has no cultivated plants, no system of appliances and tending and regulating plants and animals; he does not even anticipate the future by drying meat. When food is abundant, he gorges himself, but does not save. His habitation is a temporary improvised hut. In the interior, he does not even save skins for clothes in the cold of winter, but cooks them with the rest of the carcass. Generally even by the water he has no permanent boats, but makes one of bark when and as he needs it. He has no tools or equipment except those actually in use at the moment of getting or using food—weapons of the chase and war. Even set traps and nets which work for the savage are practically unknown. He catches beast, bird and fish with his own hands when he does not use club or spear; and if he uses nets he is himself personally concerned in their use.

Now such facts as these are usually given a purely negative interpretation. They are used as proofs of the incapacities of the savage. But in fact they are parts of a very positive psychosis, which taken in itself and not merely measured against something else, requires and exhibits highly specialized skill and affords intense satisfactions—psychical and social satisfactions, not merely sensuous indulgences. The savage's repugnance to what we term a higher plane of life is not due to stupidity or dullness or apathy—or to any other merely negative qualities—such traits are a later development and fit the individual only too readily for exploitation as a tool by 'superior races.' His aversion is due to the fact that in the new occupations he does not have so clear or so intense a sphere for the display of intellectual and practical skill, or such opportunity for a dramatic play of emotion. Consciousness, even if superficial, is maintained at a higher intensity.[1]

The hunting life is of necessity one of great emotional interest, and of adequate demand for acquiring and using highly specialized skills of sense, movement, ingenuity, strategy and combat. It is hardly necessary to argue the first point. Game and sport are still words which mean the most intense immediate play of the emotions, running their entire gamut. And these terms still are applied most liberally and most appropriately to hunting. The transferred application of the hunting language to pursuit of truth, plot interest, business adventure and speculation, to all intense and active forms of amusement, to gambling and the 'sporting life,' evidences how deeply imbedded in later consciousness is the hunting pattern or schema.[2]

The interest of the game, the alternate suspense and movement, the strained and alert attention to stimuli always changing, always demanding graceful, prompt, strategic and forceful response; the play of emotions along the scale of want, effort,

[1] For good statements by competent authorities of the Australian's aversion to agriculture, etc., see Hodgkinson, 'Australia, from Port Macquarie to Moreton Bay,' p. 243; and Grey, 'Two Expeditions,' etc., II., p. 279.

[2] See Thomas' 'The Gaming Instinct,' *American Journal of Sociology*, Vol. VI., p. 750. I am indebted to Dr. Thomas (through personal conversation as well as from his articles) for not only specific suggestions, but for the point of view here presented to such an extent that this article is virtually a joint contribution.

success or failure—this is the very type, psychically speaking, of the drama. The breathless interest with which we hang upon the movement of play or novel are reflexes of the mental attitudes evolved in the hunting vocation.

The savage loses nothing in enjoyment of the drama because it means life or death to him.[1] The emotional interest in the game itself is moreover immensely reinforced and deepened by its social accompaniments. Skill and success mean applause and admiration; it means the possibility of lavish generosity—the quality that wins all. Rivalry and emulation and vanity all quicken and feed it. It means sexual admiration and conquests—more wives or more elopements. It means, if persistent, the ultimate selection of the individual for all tribal positions of dignity and authority.

But perhaps the most conclusive evidence of the emotional satisfactions involved is the fact that the men reserve the hunting occupation to themselves, and give to the women everything that has to do with the vegetable side of existence (where the passive subject matter does not arouse the dramatic play), and all activity of every sort that involves the more remote adaptation of means to ends—and hence, drudgery.[2]

The same sort of evidence is found in the fact that, with change to agricultural life, other than hunting types of action are (if women do not suffice) handed over to slaves, and the energy and skill acquired go into the game of war. This also explains the apparent contradiction in the psychic retrogression of the mass with some advances in civilization. The gain is found in the freed activities of the few, and in the cumulation of the objective instrumentalities of social life, and in the final development, under the discipline of subjection, of new modes of interest having to do with remoter ends—considerations, however, which are psychologically realized by the mass only at much later periods.

[1] Though some writers even say that the savage's interest in the game of hunting is so great that he hunts for the excitement rather than for food. See Lumholtz, 'Among Cannibals,' p. 161 and p. 191.

[2] This collateral development of a different mental pattern in women is a matter of the greatest significance, in itself, in its relation to subsequent developments and in relation to present mental interests.

As to the high degree of skill, practical and intellectual, stimulated and created by the hunting occupation, the case is equally clear—provided, that is, we bear in mind the types of skill appropriate to the immediate adjustments required, and do not look for qualities irrelevant because useless in such a situation.

No one has ever called a purely hunting race dull, apathetic or stupid. Much has been written regarding the aversion of savages to higher resources of civilization—their refusal to adopt iron tools or weapons, for example, and their sodden absorption in routine habits. None of this applies to the Australian or any other *pure* hunting type. Their attention is mobile and fluid as is their life; they are eager to the point of greed for anything which will fit into their dramatic situations so as to intensify skill and increase emotion. Here again the apparent discrepancies strengthen the case. It is when the native is forced into an alien use of the new resources, instead of adapting them to his own ends, that his workmanship, skill and artistic taste uniformly degenerate.

Competent testimony is unanimous as to the quickness and accuracy of apprehension evinced by the natives in coming in contact even for the first time with complicated constructive devices of civilized man, provided only these appliances have a direct or immediate action-index. One of the commonest remarks of travelers, hardly prepossessed in favor of the savage, is their superiority in keenness, alertness and a sort of intelligent good humor to the average English rustic. The accuracy, quickness and minuteness of perception of eye, ear and smell are no barren accumulation of meaningless sense detail as Spencer would have it; they are the cultivation to the highest point of skill and emotional availability of the instrumentalities and modes of a dramatic life. The same applies to the native's interest in hard and sustained labor, to his patience and perseverance as well as to his gracefulness and dexterity of movement—the latter extending to fingers and toes to an extent which makes even skilled Europeans awkward and clumsy. The usual denial of power of continued hard work, of patience and of endurance to the savage is based once more upon trying him by a foreign standard—interest in ends which involve a long series of means

detached from all problems of purely personal adjustment. Patience and persistence and long-maintained effort the savage does show when they come within the scope of that immediate contest situation with reference to which his mental pattern is formed.

I hardly need say, I suppose, that in saying these things I have no desire to idealize savage intelligence and volition. The savage paid for highly specialized skill in all matters of personal adjustment, by incapacity in all that is impersonal, that is to say, remote, generalized, objectified, abstracted. But my point is that we understand their incapacities only by seeing them as the obverse side of positively organized developments; and, still more, that it is only by viewing them primarily in their positive aspect that we grasp the genetic significance of savage mind for the long and tortuous process of mental development, and secure from its consideration assistance in comprehending the structure of present mind.

I come now to a brief consideration of the second main point —the extent to which this psychic pattern is carried over into all the relations of life, and becomes emotionally an assimilating medium. First, take art. The art of the Australian is not constructive, not architectonic, not graphic, but dramatic and mimetic.[1] Every writer who has direct knowledge of the Australian corroborees, whether occasional and secular, or state and ceremonial, testifies to the remarkable interest shown in dramatic representation. The reproduction by dances, of the movements and behavior of the animals of the chase is startling. Great humor is also shown in adapting and reproducing recent events and personal traits. These performances are attended with high emotional attacks; and all the accompaniments of decoration, song, music, spectators' shouts, etc., are designed to revive the feelings appropriate to the immediate conflict-situations which mean so much to the savage. Novelty is at a distinct premium; old songs are discarded; one of the chief interests at an intertribal friendly meeting is learning new dance-songs;

[1] There are of course pictures, but comparatively speaking, few and crude. Even the carvings, if originally pictorial, have mostly lost that quality, and become conventional.

and acquisition of a new one is often sufficient motive for invitation to a general meeting.

The ceremonial corroborees are of course more than forms of art.[1] We have in them the sole exception to the principle that the activities of the hunter are immediate. Here they are weighted with a highly complicated structure of elaborated traditional rites—elaborated and complicated almost beyond belief.[2] But it is an exception which proves the rule. This apparatus of traditionary agencies has no reference to either practical or intellectual control, it gets nowhere objectively. Its effect is just to reinstate the emotional excitations of the food conflict-situations; and particularly to frame in the young the psychic disposition which will make them thoroughly interested in the necessary performances.[3]

It is a natural transition to religion. Totemism and the abundance of plant and animal myths (especially the latter) and the paucity of cosmic and cosmogonic myth testify to the centering of attention upon the content of the combat, or hunting situation. It would be absurd to attempt in a parenthesis an explanation of totemism, but certainly any explanation is radically defective which does not make much of the implication of tribe and animal in the same emotional situation. Hunter and hunted are the factors of a single tension; the mental situation cannot be defined except in terms of both. If animals get away, it is surely because they try; and if they are caught it is surely because after all they are not totally averse—they are friendly. And they seal their friendliness by sharing in one of the most intense satisfactions of life—savory food to the hungry. They are, as a matter of fact, co-partners in the life of the group. Why then should they not be represented as of close kin? In any case, attention and interest center in animals more persistently than in

[1] It is, of course, a historic fact that the actual origin of dramatic art (through the Greeks) is in mimetic dances of a festival and ceremonial sort.

[2] The best account is of course Spencer and Gillen. Certain ceremonies take weeks.

[3] Not, of course, that all these ceremonies are initiatory in character; on the contrary, many are 'magical,' intended to promote the productivity of their chief food-supplies. But even these were conducted in dramatic fashion, and in such way as to reproduce the emotional disposition involved in the actual occupational life.

anything else; and they afford the content of whatever concentrated intellectual activity goes on. The food taboos, with their supernatural sanctions, certainly create tensions, or reinstate conflict-situations, in the mind; and thus serve to keep alive in consciousness values which otherwise would be more nearly relegated to the mechanically habitual, or become sensuous, not idealized or emotionalized.

I turn now to matters of death and sickness, their cause, and cure, or, if cure is hopeless, their remedy by expiation. Here the assimilation to the psychosis of the hunting activity is obvious. Sickness and death from sickness are uniformly treated as the results of attacks of other persons, who with secret and strange weapons are hunting their victim to his death. And the remedy is to hunt the hunter, to get the aid of that wonderful pursuer and tracker, the medicine man, who by superior ability runs down the guilty party, or with great skill hunts out the deadly missile or poison lodged in the frame of his victim.

If death ensues, then we have the devices for tracking and locating the guilty party. And then comes actual conflict, actual man-hunting. Death can be avenged only by the ordeal of battle—and here we have the explanation of the wars and war-like performances of which so much has been made. It is, however, now generally admitted that the chief object of these war-like meetings is to reinstate the emotion of conflict rather than to kill. They are, so to speak, psychological duels on a large scale—as one observer says, they are 'fights with a maximum of noise, boast, outward show of courage and a minimum of casualties."[1] But the manouvering, throwing and dodging that take place are a positive dramatic exercise in the utilities of their occupational pursuits.

Finally, as to marriage, and the relations between the sexes. What was said concerning the impossibility of an adequate account of totemism applies with greater force to the problem of the system of group relationships which determine marital possibilities. It is clear, however, that the system of injunctions and restrictions serves to develop a scheme of inhibitions and intensified stimuli which makes sex-satisfaction a matter

[1] Horn, 'Expedition,' Vol. IV., p. 36.

of pursuit, conflict, victory and trophy over again. There is neither complete absence of inhibition, which, involving little personal adjustment, does not bring the sexual sensations into the sphere of emotion as such; nor is there a system of voluntary agreement and affection, which is possible only with a highly developed method of intellectual control, and large outlooks upon a long future. There is just the ratio between freedom and restraint that develops the dramatic instinct, and gives courtship and the possession of women all the emotional joys of the hunt—personal display, rivalry, enough exercise of force to stimulate the organism; and the emotion of prowess joined to the physical sensations of indulgence. Here, as elsewhere in the hunting psychosis, novelty is at a premium, for the mind is dependent upon a present or immediate stimulus to get activity going. It requires no deep scientific analysis to inform us that sex-relations are still largely in the dramatized stage; and the play of emotion which accompanies the enacting of the successive stages of the drama gives way to genuine affection and intelligent foresight only slowly through great modifications of the whole educative and economic environment. Recent writers, I think, in their interest on the institutional side of marriage (for we are going through a period of reading back Aryan legal relationships just as we formerly read back Aryan theogonies and mythologies) have overlooked the tremendous importance of the immediate play of psychic factors congruous to hunting as such.[1]

In conclusion, let me point out that the adjustment of habits to ends, through the medium of a problematic, doubtful, precarious situation, is the structural form upon which present intelligence and emotion are built. It remains the ground-pattern. The further problem of genetic psychology is then to show how the purely immediate personal adjustment of habit to direct satisfaction, in the savage, became transformed through the introduction of impersonal, generalized objective instrumentalities and ends; how it ceased to be immediate and became loaded

[1] For a statement doing justice to the psycho-physic factors involved, see Thomas, Der Ursprung der Exogamie, *Zeitschrift für Socialwissenschaft*, Bd. V., 1.

and surcharged with a content which forced personal want, initiative, effort and satisfaction further and further apart, putting all kinds of social divisions of labor, intermediate agencies and objective contents between them. This is the problem of the formation of mental patterns appropriate to agricultural, military, professional and technological and trade pursuits, and the reconstruction and overlaying of the original hunting schema.

But by these various agencies we have not so much destroyed or left behind the hunting structural arrangement of mind, as we have set free its constitutive psycho-physic factors so as to make them available and interesting in all kinds of objective and idealized pursuits—the hunt for truth, beauty, virtue, wealth, social well-being, and even of heaven and of God.

THE ATOMIC SELF.

BY PROFESSOR GEORGE STUART FULLERTON,

University of Pennsylvania.

Science has long been at work building up the conception of the material world as a mechanical system of things. Many hands have labored to rear the edifice, many still labor, and yet the pile has scarcely risen above its foundations. Only the eye of faith can see its towers and pinnacles rising in stately magnificence and dwell with pleasure upon the unity and harmony of the colossal structure. Those who are most deeply imbued with the spirit of science and who enjoy that breadth of vision denied to the myopic eye of the mere specialist, are apt to exercise this faith and to see the world as a perfect mechanism, while frankly admitting that it is quite beyond the power of science to prove it to be such. On the other hand, there are those, and among them men of great scientific eminence, who do not believe that this faith rests upon a sure foundation. The world of matter, they maintain, will not be proved to be a perfect mechanism, because it is not such.

But, whatever view we may take of the world of matter, however independent we may conceive it to be, we are nevertheless forced to recognize the existence of a realm of minds. The man who insists that nothing exists save matter is foolish—about as foolish as the man who insists that nothing exists save mind. The plain man stands between the two and finds himself in a composite world in which things material and things mental play their proper rôle without crowding each other out of existence. That the chair upon which he sits, the table at which he writes, the pen which he holds, are material things, it seems to him trivial to doubt. That there is such a thing as mechanism he can prove by pulling out his watch. On the other hand, it is *he* that pulled out the watch, a thing that can feel, think, remember, will—in short, a mind. And he cannot conceive any

man in his senses to come seriously to the conclusion that he alone possesses a mind.

That he is right in maintaining the distinction between matter and mind and in holding to the existence of both, careful analysis will only succeed in making more certain. The philosopher who denies his position may see some truth that he does not see, but his denial rests upon an imperfect apprehension of the truth. We have on our hands a world of matter and a realm of minds; neither can be declared non-existent; the only question is, what shall we do with the two? I have said that, to the plain man, the difficulty does not appear to be a serious one, because he builds the two into one system, or, at least, into something resembling a system. He treats minds very much as if they were material atoms and could influence the latter as these influence each other. But to the man who has come to look upon the material world as a perfect mechanism the problem is a far more serious one, for such a conception of the interaction of mind and matter as the above seems to make havoc of the notion of mechanism.

So serious is the difficulty that some of those whose acuteness and whose learning are undisputed have come back from a study of what many philosophers have had to say touching the problem, with a disposition to rest content with the position of the plain man as being, on the whole, the most satisfactory. The plain man appears to give a plain answer to the question, and one not out of harmony with our common experience of things. Why not accept it and let it go at that? The position seems by no means an unreasonable one, at first sight, at least. If, in taking it, one is compelled to deny the assertion of certain persons that the material world is a perfect mechanism, it is easy to point out that these persons can give no adequate proof of their assertion and to hold that they may very well be in the wrong.

But it is evidently unwise to adopt a position without making a careful examination into all that that implies. It is quite possible that such an examination will reveal that one has passed from bad to worse in abandoning philosophy for common sense. Of course, one cannot expect the plain man to realize clearly all that his doctrine implies. We must, hence, try to make

clear to ourselves what he does believe, and then judge whether such beliefs with their implications are what we should elect to adopt as a satisfactory solution of the problem of the relation between matter and mind.

Here I should premise, in the first place, that I lay myself open to easy criticism in trying to make clear what is in its nature vague and fluctuating. A man may hold a thing in mind so dimly and vaguely that he may fail to recognize any clear thought whatever as the thing he had in mind, and may resent having it attributed to him as his own. Moreover, the plain man is not one, but many, and although he may, for certain purposes, be taken generically, he presents specific differences which are not without their significance. I should premise, in the second place, that by the plain man I do not mean the *very* plain man, but the man who has some opinions, at least, on the subject of mind and matter. It must be admitted that he has not gathered his opinions independently from his own experience. Such opinions never are gathered independently. They exude from old philosophies; they are absorbed into theological and ethical systems; they leave their traces upon language and literature; they are taken up again, worked over, and incorporated into text-books for the instruction of young men; they become a part of the common thought of the race, and in the mind of every man of a moderate degree of culture they find a lodgment as part of that heritage from the past which he has accepted as he has accepted his social prejudices and his elementary notions of rights and duties. It may seem to a man that he has direct evidence in his own experience that such opinions are true. He should remember that it also seems to him that he has direct evidence that he does his thinking with his head, and not with some other part of his body. Yet it took the race a long time to discover the true significance of the brain in the animal economy, and many generations of men lived and died without being impressed with this direct evidence at all.

We may, hence, regard the opinions of the plain man on such subjects as the echoes of past philosophies; echoes which he takes for the voice of truth, and which seem to him to be just interpretations of what is given in his experience. If we

go back to these philosophies we shall often find labored attempts to make reasonably clear what he is content to leave wholly vague. It may, consequently, be objected that any attempt to state clearly the opinions of the plain man on the subject of mind and matter and their relation to each other, must result in setting these opinions aside and treating, instead, of those philosophical doctrines in which they have had their origin. The objection is not without force, and yet it is difficult to see how one can make clear what a man believes dimly and vaguely in any other way than by setting forth what his words would mean to him did he see things under a light less dim and uncertain, or what they have meant to others more given to the habit of reflection. It is not worth while to discuss a man's opinions, if it is understood from the outset that the discussion must leave the whole subject as vague as it was before. If any plain man feels aggrieved at my attributing to him doctrines which he is not conscious of holding, I beg him to assume that my words have reference to another and not to him individually. An experience, extending over a considerable number of years, with successive classes of college students representing, on the whole, the more cultivated classes in the community, has confirmed me in the opinion that there are certain philosophical tenets touching the nature of the mind held with a good deal of unanimity even by those who have done no reading in the works of the philosophers, and have no idea of the original sources of the doctrines to which they hold. They are comprehended vaguely; those who maintain them are often thrown into confusion by the first objection urged against any or all of them; but they are nevertheless held to with a good deal of tenacity. These tenets I take the liberty of calling a part of the philosophy of the plain man. Under this heading I include the following beliefs:

1. That the mind is in some sense in the body.
2. That it acts and reacts with matter.
3. That it is a substance with attributes.
4. That it is non-extended and immaterial.

In these statements there is nothing that strikes the average man as absurd or incredible. Taken together they describe

what may fairly be called *the atomic self*, that is, the self or mind vaguely conceived after the analogy of a material atom. It is true that the thing is expressly affirmed to be immaterial, but that only means that the analogy is recognized to be somewhat imperfect.

But one's satisfaction with such statements as these can only endure so long as one does not subject them to careful scrutiny and ask after their precise meaning. In what sense can the mind be regarded as in the body? and what is intended by the statement that it acts and reacts with matter? Let us ask the plain man to look at the boy chasing the dog, whom I have discussed in an earlier paper,[1] with the sharpness of vision there supposed possible. What does he see? He sees an enormously complicated system of material atoms changing their space-relations to each other unceasingly, and in such changes obeying mechanical laws. The whole system of atoms constitutes what we call the boy's body. Each atom is plainly and unequivocally *in* the body, for it is clearly a member of the group, and stands in such and such space relations to the other members. The word *in* has no doubtful meaning when one is speaking of material things. My papers are *in* my desk, that is, they occupy certain definite portions of space, and the wood which composes the desk occupies certain other portions on this side and on that. My body is *in* this room, that is, it occupies a position between the walls, can by moving in this direction touch one of them, and by moving in that, touch another. An analysis of the conceptions of matter and of space reveals[2] that when we speak of a thing as being here or there we are simply assigning to a given group of tactual sensations its position in the vast system of tactual and movement sensations which constitutes the real world in space and time. If I choose to locate a mathematical point in this room, I treat the point as I would treat an atom, and I believe that a line might be drawn from one wall through the point in question to another wall. It seems, then, that to be anywhere, in an intelligible sense of the word, a thing must be material. It must form a part of the material system of things, and this it cannot do without being itself material.

[1] THE PSYCHOLOGICAL REVIEW, March, 1901.

[2] See my paper in the *Philosophical Review*, November, 1891.

Now does anyone suppose that any degree of acuteness in vision would reveal the mind to be in the boy's body as an atom of matter is in it? Such a supposition seems to be quite excluded by the statement that the mind is immaterial. In what sense, then, can the mind be in the body? A careful examination of the plain man's opinion upon this subject reveals the fact that he really does assign to the mind, dimly and vaguely, an atomic 'in'-ness, while refusing to accept all that this implies—perhaps, even, while holding to what flatly contradicts this. The doctrine that the mind is in the body is venerable with age. At first it was a mind that was very unequivocally *in;* it was composed of fine round atoms, highly movable atoms, etc., etc. It could be inhaled and exhaled, and might escape through a gaping wound, as wine spouts through the rent wine-skin. It was a kind of matter and nothing more, having the same right to occupy space that has any other form of matter. Afterwards, it was for centuries still *in* the body, but in a much more indefinite and inconsistent fashion. It was wholly in the whole body, and wholly in every part. This scholastic doctrine I have criticised earlier,[1] and it is not necessary for me to dilate upon it here, further than to say that, to have this collocation of words mean anything to him, a man must think vaguely of "in"-ness, in the proper sense of the word, and must keep what he has in mind very vague. He must think of an immaterial atom, which by virtue of its being an atom can be somewhere, and by virtue of its immateriality can be nowhere in particular, but rather everywhere in general. It is an echo of this doctrine that comes before us as the opinion of the plain man, although he has never heard the words *tota in toto*, and may be shocked by their meaning as explained to him. He thinks of the mind as in the body, much as a material atom is in the body, and yet he does not think that it would be open to direct inspection however acute one's power of vision. He hesitates to localize it very definitely, and would be unwilling to speak of it as exactly at the middle of the straight line joining this atom and that. He shakes his head over the suggestion that, if the mind really is in the body, a line might conceivably be drawn

[1] THE PSYCHOLOGICAL REVIEW, January, 1897.

through two different brains in such a way as to pass through two different minds, whose distance apart might, thus, be accurately determined.

But it may be urged that, however indefinite the plain man's ideas may be, it is scarcely fair to foist upon him the scholastic doctrine of the ubiquity of the mind in the body. The objection is perhaps just, for that doctrine is not completely represented in the echoes of it which came back to us from most men's minds. Yet it should not be forgotten that the more completely one eliminates from one's thought the notion of this absurd ubiquity, and the more earnestly one strives to make the presence of the mind in the body a comprehensible thing, the more plain does it become that what one has in mind is an atomic self, a minute material self, which is present in the body as any material atom is present in a group of such atoms. We can see this well illustrated in the case of Descartes, whose acquaintance with the mechanism of the body led him to attempt an emendation of the scholastic doctrine. He did not deny the ubiquity of the mind, for he was willing to assert, in accordance with the orthodox tradition, that it was united to all the parts of the body 'conjointement.' Nevertheless, he assigned to the mind a 'siège principale' in the little pineal gland in the middle of the brain. Listen to what he has to say touching its behavior in this its inner sanctum:

"Let us here, then, conceive of the soul as having her chief seat in the little gland which is in the middle of the brain, whence she radiates to all the rest of the body by means of the spirits, the nerves, and even the blood, which, participating in the impressions of the spirits, can carry them through the arteries to all the members. And let us remember what has been said above of the mechanism of the body, to wit, that the little threads of our nerves are so distributed to all its parts, that, on occasion of divers movements excited in those parts by the objects of sense, they open in divers ways the pores of the brain, which brings it about that the animal spirits contained in these cavities enter in different ways into the muscles, by means of which they can move the members in all the different ways in which they are capable of being moved; and also that all

other causes, that can move the spirits diversely, can conduct them to divers muscles. Let us add, too, that the little gland which is the chief seat of the soul is so suspended between the cavities that contain these spirits, that it can be moved by them in as many different ways as there are different sensible qualities in the objects; yet that it can also be moved in different ways by the soul, whose nature is such that it receives as many different impressions, *i. e.*, has as many different perceptions as there are different movements in this gland. The mechanism of the body is so constructed that, simply from the fact that this gland is moved in divers ways by the soul, or by whatever cause may be, it pushes the spirits which surround it toward the pores of the brain, which conduct them by the nerves to the muscles, and thus makes them move the members."[1]

"Thus, when the soul wills to call anything to remembrance, this volition brings it about that the gland, inclining itself successively in different directions, pushes the spirits towards divers parts of the brain, until they find the part which has the traces that the object which one wishes to recollect has left there. For these traces are nothing except that the pores of the brain, through which the spirits have formerly taken their course because of the presence of the object, have acquired thereby a greater facility than the others of being opened again in the same way by the spirits which return to them. Thus these spirits meeting these pores enter more easily into them than into the others, by which means they excite a peculiar movement in the gland, which represents to the soul the same object and makes it conscious that it is the one it wishes to recollect."[2]

Can anything be more clearly material than this little mind that sits in the pineal gland? It has its definite place among other material things; it appears to be able to push and be pushed like the veriest bit of matter. Its presence in the body does not seem at all incomprehensible, for it does not appear to be in any wise different from the presence of a pen between a man's fingers, or the presence of a human body in a room. If

[1] 'Les Passions de l'Ame,' Art. 34. The 'spirits' here referred to are, of course, the 'animal spirits,' and nothing immaterial.

[2] Ibid., Art. 42.

one goes on to say that the mind is wholly without extension, is immaterial, and the like, one's thought becomes once more somewhat confused, for one is affirming material presence and in the same breath denying that the thing present is really material. But if one's thought is sufficiently vague, the contradiction is not unpleasantly apparent, and may conveniently be overlooked. The scholastic doctrine tries to make too clear what is meant by *immaterial* presence; it stirs up the contradiction and makes it growl, striking fear to the heart of the beholder. Descartes, in his doctrine of the soul's seat, emphasized the *presence*, and passed over the difficulty about its being immaterial. It goes without saying that if one emphasizes *both* sides of the inconsistent doctrine, and makes both clear, the result cannot but be disconcerting—except to the chosen few who have embraced a philosophy of contradictions, and rejoice in the absurdity of the conclusions to which their reasonings conduct them.

That the attempt to make at all clear the nature of the presence of the mind in the body reveals that what is really at the heart of the plain man's thought is a material presence, may be equally well illustrated by taking a modern instance. No one kept closer to the philosophy of the plain man than the late Dr. McCosh. His works have appealed to a very large number of cultivated persons, not specialists in philosophy, as embodying the most sensible opinions, and the most reasonably conservative, on many subjects with which the philosopher deals. He has never been accused of being a materialist, and he certainly never meant to lend his countenance to those who incline to this type of thought. Yet when he comes to speak of mind and body, and makes the effort to be a little explicit, he is capable of writing as follows:

"The mind is so constituted as to attain a knowledge of body or of material objects. It may be difficult to ascertain the exact point or surface at which the mind and body come together and influence each other, in particular, how far into the body (Descartes without proof thought it to be in the pineal gland), but it is certain that when they do meet mind knows body as having its essential properties of extension and resisting energy."[1]

[1] 'First and Fundamental Truths,' N. Y., 1889, Part II., Book I., Chap. II.

Here we find the scholastic ubiquity stripped away. The mind is not in the body 'in general,' but is located at some unknown distance within the skin. It can *meet* matter; it can *come together* with it, possibly at a point, possibly at a surface. Must it not be a material mind that can act thus? In contemplating the boy's brain as a swarm of atoms, we can at least conceive any two of them as meeting each other. They can lie side by side in space, with no room between them. They can *touch* each other. Whether atoms do actually ever touch each other is not a question with which we need concern ourselves here. We can conceive that they do, and we can use the expressions 'come together' and 'meet' in a perfectly intelligible sense. But suppose one of the atoms to be immaterial, that is, suppose it not to be an atom, a thing that can be touched. What can we mean by a *meeting* between a thing that can be touched and a thing that can not? They can certainly not touch each other, and if not that, what do they do? It is perfectly evident that, in so far as Dr. McCosh's conception seems to the reader satisfactory, it is because he has emphasized the presence of the mind in the usual sense of the word presence, and has passed over the difficulties which arise out of the attempt to combine with this the notion of immateriality.

And if, when one emphasizes the notion of immateriality, that of the presence of the mind fades out into utter indefiniteness, what becomes of the conception of interaction? We can conceive of a new atom being brought into the group of atoms which constitute a human body, and of its interacting with them. This means that it and the others approach to or recede from each other in ways that can be explained by a reference to mechanical laws. Interaction in this sense seems out of the question where one is no longer dealing with material things. But in what sense, then, can we speak of the interaction of mind and body? It is easy to say that when the mind wills, such and such changes take place in the material world; but to say this is simply to go back to the common experience that there is such a thing as volition, and that this is in some way related to the changes that take place in the world of material things. This experience no one cares to deny. It is admitted as frankly by

those who regard the world of matter as a perfect mechanism, as it is by the interactionist. From this experience to the doctrine of the atomic self in the pineal gland or elsewhere is a very long step, and one never made by the plain man independently. When he makes it, he has passed from experience to philosophical theory, and it is perfectly just that this philosophical theory should be expected to stand or fall according as it succeeds in explaining or fails to explain the experience which it undertakes to make comprehensible. It is, then, right that we should ask how this atomic self is to be conceived as setting in motion material atoms. What is its volition? Shall we think of it as a motion? If we do, we are back again within the realm of matter. Shall we deny it to be a motion, and hold that it is a peculiar and indescribable occurrence which takes place *within* the self, and wholly within the self? Then how shall we conceive this change within an immaterial atom to bring about motions in material atoms? The immaterial atom is not spatially present, in any intelligible sense of those words; the change which has taken place is wholly within it; and yet it is to be regarded as the cause of motions in matter. If this does not strike the plain man as a serious difficulty, it is because he sees so dimly that he is unable to recognize a difficulty when he meets one.

But to those who have given the subject careful thought, the difficulty of patching up a mechanism with immaterial cogs and couplings has seemed an enormous one. Descartes appeared to have made reasonably comprehensible the interaction of mind and body when he placed the former in the pineal gland, where it could, so to speak, hold in its hand all the strings of the machine. On the other hand, Descartes had declared the mind to be non-extended, and had made its essence to consist in thought. How could such an entity be conceived to possess a hand material enough to hold material strings at all? This problem had to be faced by Descartes' successors, and, the notion of immateriality winning the day over that of material presence, they felt compelled to deny that it could hold the strings. The mind wills, said one, but it cannot, thereby, directly affect matter; on occasion of its volition, God brings

about changes in material things. The mind perceives things, said another, but not by virtue of their directly affecting it; it sees things in God. The difficulty is as great now as it ever was, and if the plain man is not driven to such extremes by the inconsistency of his doctrine, it is, as I have said, because he does not greatly emphasize the notion of immateriality. His explanation of the interaction of mind and matter can only seem to him an explanation in so far as his thinking is materialistic. No man would attempt to fill in a gap in a series of colors by the insertion of a smell clearly recognized to be such. But a man might talk of completing his color-series in this abnormal way, if he dimly conceived of a smell as being some kind of a color.

It is, hence, sufficiently clear that it is easy to conceive this immaterial atom as present in and interactive with the body, only so long as one dimly thinks of it as material. When one is careful to eliminate from one's thought every suggestion of the material, all positive content seems to vanish. Nor is there a difficulty only with the conceptions of presence and interaction. If it is true that it is hard to conceive of the atomic self as having a rôle to play in the management of the bodily mechanism, it is no less true that it is hard to frame any idea, which shall have even an approach to clearness, of the nature of this immaterial entity and its relation to its ideas. We are told that it is an immaterial substance and that it possesses attributes. But what, in general, is a substance, and what is its relation to its attributes? If we search curiously into this obscure notion we are carried back many centuries in the history of philosophy, and we realize that the opinions of the plain man have their roots in a remote antiquity. We see that it has seemed to many generations of thinking men too evident to require proof, that each thing must consist of a substance with its qualities or attributes. The qualities are color, form, hardness, taste, smell and the like, in the case of certain things, and thinking, remembering, willing and the like, in the case of others. The substance is of a more retiring nature, and does not present itself to direct inspection. Nevertheless, it is there, and it is indispensible. It is *substance*, *substratum*, that which underlies the qualities, that which *has* them. It exists in itself—*per se subsistit*—and they

exist in it as dependent existences. If one will imagine a pin-cushion stripped of those qualities by which we commonly recognize it to be a pin-cushion, its extension, its hardness, its weight, its color, etc., etc., and if we will permit it to retain only the property of holding the pins which are stuck (?!) into it, we shall have something that at least suggests the substance which busied philosophers all through the middle ages, and busies a number of them even at the present time. It has survived some very serious shocks in its day. When Descartes made a feint of sweeping aside all the philosophical prejudices which had come down to him from the past, he was unable to rid himself of this notion. He made the essence of matter to consist in extension, and the essence of mind to consist in thought, but these essences are not in themselves complete and independent. They drag with them as their shadow the substance or substratum which the 'natural light' (a euphemism for inveterate prejudice) convinced Descartes must accompany every quality or attribute.[1] The substances thus brought in play no part in the Cartesian philosophy; throughout the whole four acts they remain behind the scenes. Still they are assumed to be present, and to be in some obscure way indispensible to the drama.

One of the most serious attacks ever made upon this ghostly pin-cushion was made by one of its friends. When John Locke undertook to make clear the distinction between ideas, qualities of things, and substance, he did the last of these a great disservice. He made it too clear that, when one has carefully distinguished between qualities and substance and has set all qualities of whatever sort on the one side and naked substance on the other, the nakedness of the thing is so complete as to resemble the emptiness of a vacuum. One is tempted to ask whether one has anything left at all. We have no idea what substance is, said Locke; we have only an indefinite notion of what it does. It is a 'we know not what,' and its function is to hold together the bundle of qualities which constitute the things we do know. The idea could not have been gained from any experience whatever, and its existence cannot be

[1] *Prin. Philos.*, I. 11.

logically defended.[1] Surely an entity at such a pass has no excuse for existing; we do not know what it is; we have not the faintest idea how it can do what it is supposed to do; the fact of its existence has been assumed without apparent justification. It appears to be made out of whole cloth, if so mere a nothing can be said to be made out of cloth at all, and did it possess a particle of self-respect it would expire and be done with. Curiously enough, it does not expire even in the pages of Locke, which contain poison enough to make way with a dozen such; and it is not surprising that it lurks in the obscurer corners of the mind of the plain man, who may quite fail to see that it is living on through sheer effrontery and in spite of the fact that it has logically died and been buried.

The interesting question is, why does it live on? Why does it seem worth while for men to insist upon the existence of so mere a nonentity? This question we can answer by pointing out that this nonentity is a vampire which draws from the qualities, with the sum total of which it is supposed to be contrasted, the few drops of blood which nourish its equivocal being. John Stuart Mill, in his remarkable chapter on "The Psychological Theory of the Primary Qualities of Matter," has insisted that, when we speak of material substance, we really have in mind the touch-qualities of a thing, qualities which, taken together, form, as it were, an inner nucleus, to which we refer all the other qualities.[2] His analysis is quite in the line of modern psychological investigations, which recognize that the real world in space and time is a world revealed in terms of touch-movement sensations. But Mill might profitably have brought out more clearly the fact that, when we distinguish between a *thing* and its qualities, the *thing* is not clearly recognized by us to be composed of qualities of any sort. It is indefinitely thought of as the possibility of all the qualities, the center from which they emanate, the bond of union between them. It is the group as a group, contrasted with the individuals which compose it. Manifestly, if we carefully put all the individuals aside, the group disappears and we are left without a residue.

[1] 'Essay,' Book I., Chap. IV., § 18; Book II., Chap. XXIII., § 4.
[2] 'An Examination of Sir William Hamilton's Philosophy,' Chap. XIII.

This is what Locke did and he left himself empty-handed. But in so far as Locke still believed in substance, and indefinitely thought of it as a real existence, he did what is done by the plain man, he made an imperfect abstraction, leaving enough of the qualitative to prevent his substance from becoming a mere nothing. He was, of course, inconsistent, but inconsistency comes to be regarded as almost a prerogative of the philosopher by those who read much in the history of philosophy. Material substance remained to Locke enough of a touch-thing to be in this place or that, to be moved about. He thought of it vaguely as one thinks of things that can be touched, and there certainly was dimly present to his mind the core of tactual qualities upon which Mill dwells and which he himself in his moments of clearer thought set over against substance as something to be contrasted with it.

With the useful distinction between substance and qualities I have no quarrel. I wish merely to point out that it is very easy to misconceive the significance of the distinction, and to suppose that the substance is a something that can be set over against the qualities in their totality. It is a little as though one distinguished between the river and all the water that ever flows in the river. And when one falls into the error of treating substance in this way, it is clear that one gains an indefinite meaning for what would otherwise be an empty word, by borrowing something from the bundle of qualities with which the substance is contrasted. When the plain man distinguishes between this table and the qualities of the table, his words undoubtedly mean something to him. The table as substance is not to be accepted as a mysterious and unanalyzable datum in his experience. It is perfectly possible to analyze the conception, and to show what elements are present in his thought. There is present in a vague and shadowy way that core of touch qualities emphasized by Mill, and this is present even when he insists that he is not thinking of qualities at all. Were it not present he would not treat substance as he does, giving it a local habitation, and thinking of it as *in* things.

That this is in his thought when he talks of material substance, and that this content accounts for the satisfaction with

which he comes back to a conception which would otherwise be to him a meaningless abstraction, is sufficiently clear. But what has been said above about the general tendency to give the atomic self a materialistic presence in the body makes it also evident that this is present in his thought even when he is talking about a substance which he assumes to be immaterial. Surely this is illegitimate in the highest degree. An immaterial self must not be represented in our minds by any group of touch-qualities, however indefinite. How, then, shall we think it?

The problem is a very serious one, indeed. How important a part the touch-movement sensations play in a man's notion of material substance, he can make clear to himself by trying consistently to carry out the Lockian abstraction. Here is this table: it is colored, hard, extended. One may think of these qualities as inhering in a substance. Now abstract in thought the color. The table seems to remain; it is a table in the dark. But abstract every degree of hardness, and all extension. The table seems to disappear completely. Yet the hardness and the extension are assumed to be qualities, and distinct from the substance which underlies them. Nevertheless, in their absence, the substance evaporates. Is the substance in itself extended? or is extension only one of its qualities? If it is not in itself extended, how can it 'hold together' this whole expanse of table-top? How can it be, in any intelligible sense of the word, a *substratum?* One can not spread a non-extended entity under an expanse of anything, and if it is not necessary for the substance to be spread under the qualities in any sense at all, why may not the substance of that door support the qualities of this table as well as the qualities of that door? One who travels this road may easily reach the point of maintaining that there is only one substance, and this is next door to maintaining that there is no substance at all, at least in any sense of the word at all analogous to that in which it has been used in the preceding discussion.

Now when a man talks of an immaterial substance he almost forces himself to a Lockian thoroughness of abstraction in his treatment of substance. The dim core of touch-qualites which

has inconsistently remained in his thought and has prevented him from groping in mere emptiness is threatened with total extinction. How is he to think even dimly of this immaterial substance? He feels impelled to assert, in accordance with the ancient tradition, that it is simple and non-extended. But these negative determinations are just the knife that should cut him off from the vague materialistic content that gives its meaning to his conception of substance. His only recourse is to retain at all hazards a little meaning, and allow his thought to grow still dimmer than it was before. If his material substance was the shade of a group of material qualities, his mental substance, the atomic self, is the shade of a shade. So dim is it and so unreal, that he has not the least expectation of attaining to any clear ideas regarding it, and he may even resent the attempt to set it in a sharper light. His notions of it and its ideas and activities are a mere mess of inconsistencies and incomprehensibilities, and with this mess he is content because he does not believe that consistency and clearness can justly be looked for in this corner of the realm of human knowledge. When, therefore, one talks of abandoning the speculations of the philosophers and of coming back to the more sober conceptions of the plain man, it is right that we should ask him to open his eyes and see to what he is coming back. He is not coming back to experience, *i. e.*, to uninterpreted experience. He is abandoning certain speculations for certain others, which, by no means satisfactory in themselves, yet seem satisfactory to a large number of persons, because they are matter of tradition and have come to fit their habits of thought as an old shoe fits the foot.

That there is nothing even moderately clear in this doctrine is written all over its face. We have seen that when we ask what the atomic immaterialistic self is and how we are to conceive it, no answer is forthcoming. It appears to be a shadow of a materialistic shadow. When we ask how it can be present in the body, it becomes evident that, in so far as it is thought of as present, it is thought of as material. Manifestly we must not think of it as material. When we ask how it interacts with matter, no one even pretends to give us information. If, now, we turn in desperation to enquire at least how we are to con-

ceive its relation to its own ideas, we fare no better. What do we mean when we say that it *has* ideas? May we regard the ideas as minute pictures that exist in or on the surface of this substance? A good many intelligent persons can be brought to confess, by means of a little questioning, that they are apt to represent the thing to themselves in this way. But a moment's reflection makes it apparent that this will not serve even to give a hint of the relation which must be conceived to obtain between the atomic self and its ideas. That which is perfectly simple and non-extended cannot have an inside and an outside, and it is not conceivable that anything should be either in it or on it, in any intelligible sense of those words. Moreover, the ideas themselves do not appear to be simple. If I close my eyes and call up in imagination a barber's pole, it seems to stand before me as an extended thing in which white lies beside red and red beside white. Does it mean anything whatever to talk of this composite something as either *in* or *on* a non-extended and simple substance? To be sure, I may maintain that the imaginary barber's pole only *seems* to be extended, and is not really extended at all; but if I do this I fall headlong into a difficulty quite as grave as the one I am seeking to avoid. How can that which is quite simple and non-extended seem to have part out of part? Has it really no parts at all? Am I fed with pure illusion, and is the white not really different and distinct from the red and the red from the white? One may diminish the size of a thing and yet retain certain characteristics which make it possible to distinguish it as a thing of a given class. A small picture of a horse and a large one may both be recognized to be pictures of a horse. But if we annihilate altogether the extension of the picture of a horse, if we conceive it to shrink into the nothingness of a mathematical point, this simple and non-extended something has ceased to be a picture of a horse at all. It is inconceivable that it should represent any creature in the heavens above, in the earth beneath, or in the waters under the earth. When, therefore, the plain man loosely talks of ideas as *small* pictures, he may be speaking unwisely, but he is not talking mere nonsense. It is reserved for him to do this when, laboring under the delusion that it is his duty to put these ideas

in or on a non-extended self, he affirms of them *absolute simplicity* in the hope that this may render his task a less desperate one. We must admit, in his justification, that it does seem somewhat plausible to maintain that it is more difficult to conceive of an extended thing as existing in or on a non-extended thing than to conceive of a non-extended thing as doing this. Still, men have more than one idea at a time, and he who has reduced his ideas to punctual insignificance as a preliminary to incarcerating them in their spaceless cell, must still ask himself how two or more ideas thus bottled can be conceived to remain distinct and distinguishable.

When brought to bay by questions, the plain man may not unreasonably maintain that, in speaking of the relation of the self to its ideas, he uses the words *in* and *on* in a loose sense, and does not intend them to be taken with offensive literalness. We all say in common life that ideas are in the mind, and we do not stop to make clear to ourselves what our words mean. But philosophic theory—and the doctrine of the atomic self is a philosophic theory—has no right to be content with the indefiniteness of thought which may serve a useful purpose in common life. When Berkeley has set forth his doctrine that the things of sense are only ideas, and are, hence, in the mind, he comes face to face with the objection that, if they are extended and yet are in the mind, the mind must be extended. This consequence he is not ready to admit, and he argues that the mind is not extended, for these things are in the mind only 'by way of idea.'[1] What can this mean? Nothing definite. He has fled to the refuge of the plain man—obscurity. Ideas are *in* the mind somehow, but just how cannot be made plain. In the foregoing pages I have tried to make it clear that, when the indefinite thought of the plain man is carefully examined, it is found to be the echo of an ancient materialism or semi-materialism. This gives it its positive content. With this it attempts to combine the statement that the self is immaterial. When great emphasis is laid upon this latter, the positive content of the atomic doctrine is wiped out of existence. But in most men's minds great emphasis is not laid upon this negative

[1] 'Principles of Human Knowledge,' § 49.

element, and they can find satisfaction in the indefinite materialistic notions which they continue to hold touching the substance of the self, its relation to its ideas, its presence in the human body, and its interaction with matter.

It may appear to some that I am beating a dead horse in thus criticizing at length the doctrine of the atomic self. It is held in certain quarters that the notion of *substratum* has been so thoroughly exploded that it is scarcely necessary to waste time over it. Whatever the self may be, it is said, we can at least be sure that it is not the Lockian *substance*, for it is mere misconception to assume that things have an indefinite and unintelligible core of this kind. But it is by no means evident that the doctrine is so dead as those who speak thus would have us believe. No doctrine can hold its own for centuries as the orthodox belief of the scholarly world, without leaving its trace upon the thought even of an age more or less influenced by new ideas. The doctrine of the atomic self is emphatically that of the plain man to-day, *i. e.*, it embodies the notions cherished by vastly the greater part of the cultivated persons whom one meets, touching the nature of the mind and its connection with the body. Until quite recently it was about the only doctrine taught to the youth in the higher institutions of learning in England and America, and it is still presented as the final word of wisdom in many quarters where one might have expected to find something better. Nor must it be overlooked—and this is a point of especial importance—that some of those who appear to be the most energetic in their repudiation of the atomic self do not really repudiate it at all. They refine it away, they sublimate it, they deny to it a place in time as well as a position in space, they render it the most incomprehensible of all incomprehensibles, they call it a self-activity—and, in the face of all this, they go on thinking of it indefinitely in much the same way as the plain man thinks of his atomic self. The dust of words which they have raised makes it more or less difficult to distinguish what is the true content of their doctrine. Nevertheless, a careful examination cannot fail to reveal that they are true descendants of the substratumists, and that, if their balloon has taken an all too erratic flight into the region of thin air, it

is only because they have been more incautious than the genuine substratumist in throwing out the materialistic ballast that keeps the doctrine of the atomic self from resolving itself into mere negations. Of this Neo-Kantian branch of the substratumists I have treated elsewhere,[1] and it is unnecessary for me to enter into the matter here at greater length.

But what shall we say to one who drops the substratum self altogether and assigns to *ideas* the rôle which has heretofore been assigned to it—who makes ideas determinative of motions in matter? This can hardly be said to be a doctrine affected by the plain man, for he must have, as we have seen, a something in which ideas may inhere or to which they may in some sense belong. Still it is a possible doctrine, and it may not without justice be regarded as a development from or a modification of the plain man's doctrine. That they have much in common becomes evident just as soon as we endeavor to make quite clear what is meant by the statement that ideas are determinative of motions in matter. We are to conceive that a detailed knowledge of all the motions of all the atoms constituting the body of the boy who is chasing the dog would reveal that we are not dealing with a perfect mechanism. At some point there is a break. All the motions which have preceded will not account for all the motions that follow. We must fill up this gap with ideas and suppose them to be capable of being affected by the machine and, in turn, of affecting it. In other words, the ideas become, at least for the time being, a part of the machine.

Now, that ideas should become even for an instant a part of the machine can seem simple and natural only to one who has no clear conception of all that this implies. If the statement that matter can act upon ideas and ideas upon matter is to mean anything at all, and is not to remain an empty collocation of sounds, we must conceive the ideas to be *present* in the body. The machine needs patching up *at the break*, and the insertion of a coupling which is not present is manifest nonsense. If the ideas are not entities which exist in space, if they are nowhere, then they are, of course, no nearer to the point at which they are needed than they are to any other point in the body. Indeed,

[1] THE PSYCHOLOGICAL REVIEW, January, 1897.

they are no nearer to this point than they are to any point in any other body, and the notion of the insertion of ideas to fill a gap simply lapses. Descartes realized this truth perfectly well, and he took care to put his soul in the little pineal gland, where it could do the most good. If we deny that the things which interact are *present* to each other, if we deny that they form part of the same system in space, we exenterate our notion of interaction, and it becomes a mere shell. As a matter of fact we do not have to go far afield to discover that those who trace the series of changes which run from the periphery of the body along the afferent nerves, and the series of changes which run from the central nervous system along the efferent nerves, and find it impossible to connect these with each other except with a coupling of ideas—we do not, I say, have to go far to find that these vaguely assign to ideas a spatial presence, and put them *between* the two sets of changes. They do precisely what the plain man does with his atomic self, and they do it, just as he does, without a clear recognition of what it is that they are doing.[1]

[1] "If feelings are causes, of course their effects must be furtherances and checkings of internal cerebral motions, of which in themselves we are entirely without knowledge. It is probable that for years to come we shall have to infer what happens in the brain either from our feelings or from motor effects which we observe. The organ will be for us a sort of vat in which feelings and motions somehow go on stewing together, and in which innumerable things happen of which we catch but the statistical result. Why under these circumstances we should be asked to forswear the language of our childhood I cannot well imagine, especially as it is perfectly compatible with the language of physiology. The feelings can produce nothing absolutely new, they can only reinforce and inhibit reflex currents, and the original organization by physiological forces of these in paths must always be the groundwork of the psychological scheme.

"* * * The nerve-currents, coursing through the cells and fibers, must in this case be supposed strengthened by the fact of their awaking one consciousness and dampened by awaking another. *How* such reaction of the consciousness upon the currents may occur must remain at present unsolved.

"* * * Habitual actions are certain, and being in no danger of going astray from their end, need no extraneous help. In hesitant action there seem many alternative possibilities of final nervous discharge. The feeling awakened by the nascent excitement of each alternative nerve-tract seems by its attractive or repulsive quality to determine whether the excitement shall abort or shall become complete. Where indecision is great, as before a dangerous leap, consciousness is agonizingly intense. Feeling, from this point of view, may be likened to a cross-section of the chain of nervous discharge, ascertaining the links already laid down, and groping among the fresh ends presented to it for the one which seems best to fit the case."—James, 'Psychology,' Chapter V.

If, then, the ideas are to be built into the machine in even a semi-intelligible sense, they must be conceived to be present in the body. We have seen above that, when we strive to get a clear understanding of the nature of the presence of the atomic self in the body, we discover it to be a dimly-imagined material presence. Here the case is the same. But this vague attribution to ideas of a material presence must go the way of all misconceptions when its true significance is brought to light. Let us suppose that the idea thus made determinative of motions in matter is that of a yellow dog. Shall we place this at a definite point in the mist of moving atoms that constitute the boy's brain? Can atoms move toward it and away from it? Can they touch it? Can it move from place to place? Is it spread out in space as it seems to the boy to be, or must we assume it to be a mathematical point? If it cannot lie between two atoms, approach and be approached, touch and be touched, in what sense can it be declared to be present? He who talks vaguely of its presence, and does not raise any of these questions, is walking in thick darkness and is unaware of that fact. He dimly conceives ideas to be material, just as the plain man dimly conceives of the atomic self as material. He puts them in space, and yet he would shrink from the consequences that this entails, did he realize what those consequences are.

This doctrine that ideas may be used to patch up a defective mechanism does not need to be discussed at great length, because it differs so little, in any point that need concern us here, from the doctrine of the atomic self. One is impressed, in studying both the original doctrine and its modification, with the thought that it is exceedingly hard for the human mind to shake itself free from materialistic ways of thinking. Some of those who have been most anxious not to be accounted materialists have retained the most unmistakable traces of materialistic thought.

EXPERIMENTAL INVESTIGATIONS CONCERNING THE DEPTH OF SLEEP.[1]

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The question of the depth of sleep has already been discussed in a book by one of the present writers[2] from both the critical and the experimental standpoints. The curves of depth constructed by Kohlschütter, Mönninghoff and Piesbergen, Michelson, and Lambranzi were there given, and the methods used by these and other investigators criticized.[3]

In general, auditory stimuli were used as means of wakening; but Michelson and Czerny experimented with electricity also, and Lambranzi with auditory, visual, and olfactory stimuli, used one at a time or simultaneously. In the above-mentioned book one of us described some experiments performed with tactile and pressure stimuli, using Griessbach's esthesiometer with sharp and blunt points.

This method had the great advantage of producing in the sleeper (at least where normal subjects were concerned) a single and continuous excitation, instead of a series of excitations separated by a more or less extended interval of time. Note was made not only of the degree of pressure at which waking was effected, but also of the degree at which the sleeper made defensive or withdrawing movements; so that, constructing a diagram with the values obtained, two curves were obtained: one of conscious reaction, representing the curve of the points of complete awaking, or *curve of the depth of sleep*, the other the curve of *subconscious reaction*. Some figures were there given[4] which it is deemed advisable to reproduce here.

[1] Translated from the authors' MS. by Professor Howard C. Warren, Princeton University.

[2] S. De Sanctis: 'Die Träume,' etc. Durch zahlreiche Nachträge des Verfassers erweiterte Uebersetzung, von O. Schmidt. Halle, Marhold, 1901, pp. 207 ff.

[3] For bibliography, see the work cited.

[4] S. De Sanctis, op. cit., p. 214.

EXPERIMENTS ON A BOY OF EIGHT YEARS; DURATION OF SLEEP, FROM 9 P. M. TO 8 A. M.

SERIES 1.

Hour: 10	Subconscious reaction: 15	Waking-point: 60
11	35	70
4	10	25
7	10	30

SERIES 2.

Hour: 10	Subconscious reaction: 15	Waking-point: 60
11	30	60
4	15	30
7	15	25

SERIES 3.

Hour: 10	Subconscious reaction: 15	Waking-point: 65
11	35	65
4	15	35
7	10	40

These tests show that in the child experimented upon the depth of sleep was greatest at 11 p. m. and became lighter in the early hours of the morning. They also show that the subconscious reaction maintained approximately the same proportion to the degree of depth of sleep throughout.

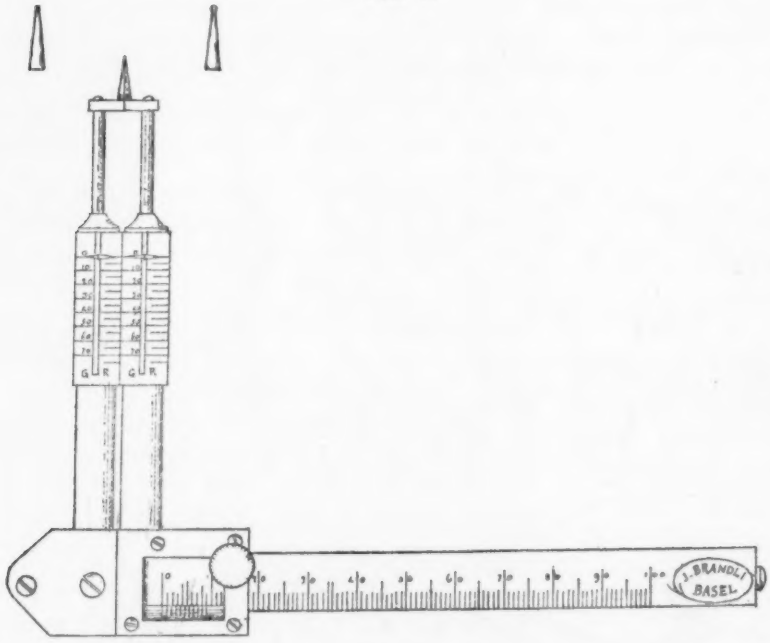
The experiments referred to were meager, however, and hence far from conclusive. We desired to carry them out on a much larger scale and to attempt by means of the method of tactile excitations to construct the *curve of the depth of sleep* for various subjects.

The instrument employed was the *Griessbach esthesiometer* (made by Brändli of Basel), adapted to admit of using stimuli given by a single point. For this purpose a metal cap was fitted over the two points of the instrument brought close together, but in such a way that the action of the moving shafts was perfectly free; the extremity of the cap terminated in either a rounded surface or a blunt point. (See Fig. 1.)

We were soon compelled to discard the rounded point, for the reason that the stimulation was generally insufficient to produce awakening when the depth of sleep had attained a certain intensity; we therefore made use of the blunt point, or of the two sharp points of the esthesiometer brought together so as to

form a single point. However, as basis of experiment with all subjects the blunt point was chiefly employed, as it best answered our purpose, being able to bring about awakening without pain, and at the same time doing away with the danger of the instrument's slipping and inflicting injury, in the event of a sudden movement by the sleeper. Moreover, in cases of light sleep, if the awakening were effected suddenly by means of a painful stimulus, it would not have been possible to construct an exact curve, especially for the periods during which the depth of sleep was at a minimum.

FIG. 1.



The experiments were carried on for about six consecutive months, one or at most two per night, so that the normal course of sleep might not be in any way altered, as would evidently have been the case had the tests been made too close together. The experiments were always performed at different hours on successive and irregularly alternated nights; several observations were made in hours already used, in order that a more exact value might be obtained, and at least four different periods

were selected for each hour of sleep, so that we might find the waking-points for every ten or fifteen minutes, in order to make the curve as complete as possible.

In our notebook we recorded all the observations as they were made, and any influences which might have effected a modification of the physical or moral well-being of the subject of experiment.

The four normal subjects upon whom experiments were made were relatives of one of the writers; two were of mature age, the other two young people; all were sound and in the best of health. They slept in separate rooms. One of us, taking his station in an intermediate room, could keep close watch of the moment at which they fell asleep, determining it from the cessation of movement, the rhythm of breathing, etc. We had previous knowledge of the habits of each of the subjects in falling asleep.

The hour at which they fell asleep being thus ascertained, the experiment was performed at the time selected. One of us entered in bare feet and without making the slightest noise approached the sleeper's bed, which had beforehand been moved out from the wall to enable him to move around it easily. The head of the bed was low, so as to present no obstacle to his movements. Having ascertained that the subject gave no sign of waking, he threw a dim light upon his forehead by means of a small dark-lantern, provided with a screen below and having the luminous aperture reduced to a minimum, so that the light should not strike the subject's eyes at all, but illuminate only the part under examination and the scale of the esthesiometer. Then the point of the instrument, held vertically in the right hand, was placed gently on the forehead, in contact with the left frontal protuberance at its upper extremity near the borders of the hairy part of the scalp. (The forehead was selected to avoid the necessity of uncovering the sleeper, the left side in order that the stimulation might always be at the same point and because it was more accessible, owing to the general custom of sleeping on the right side.) Pressing the instrument down in a uniform and continuous manner, so that the spring passed along the graduated scale from end to end in twenty seconds, the ob-

server watched carefully for the instant when the sleeper first made a movement—a wrinkling of the forehead, slight movement of the head or limbs, change in the rhythm of respiration, etc.; he then read on the scale the number opposite the point where the indicating needle was situated at that instant; the pressure was continued without interruption until the subject awoke, and note was made of the point at which the waking occurred.

If, as occasionally happened, the reflex movements of the sleeper were somewhat energetic, such as a sudden movement of the head or a change of position of the body, so that it was impossible to keep the instrument applied continuously to the forehead, it was withdrawn and the excitation recommenced after an interval of ten seconds, in such a way that the pause and the duration of the new excitation should together occupy not more than thirty seconds.

The experiments on the abnormal subjects were made in the months of March and April, 1901. There were five such subjects: two epileptics of long standing (E. B., T. R.), one case of epilepsy due to a wound (G. G.), one hystero-epileptic degenerate (F. B.), and one case of paralytic dementia (L. M.).

These tests also were made on irregularly alternated days (the subjects never knowing whether they would be wakened in the night or not) and at various hours, a couple of times per night with an interval of three or four hours between the two tests.

On account of the many practical difficulties not more than 25 or 30 esthesiometric readings per subject could be made, on the average, giving the waking-points for every twenty minutes, or thirty at the most; these points, however, were more than sufficient to give us an amply complete curve, the variations in the depth of sleep being quite large, as we were convinced from the experiments on the normal subjects.

On the nights of experiment one of us, taking his station in a room near that in which the patients slept (at the Psychiatrical Clinic of the University of Rome), determined the time at which each of them fell asleep. The subjects under examination, not more than three of whom were used at a time, slept together in a large dormitory, but in beds situated so far apart that the experiments made on one patient did not disturb the slumber of

the others. One of us softly entered the dormitory, and standing behind the bed, which was placed at a distance from the wall, cast the light of his lantern, as before, on the forehead only, and pressed on this part with the instrument, always upon the left frontal protuberance, observing and writing down at once the degrees corresponding to the first reflex reaction and the complete awaking of the sleeper—proceeding, in a word, as with the normal subjects.

The observations made each time, together with the data obtained from questions put on the morning following each night of experiments, were recorded in a notebook in which was also recorded anything which might have happened during the preceding day to any of the patients experimented upon.

The following tables give the values obtained in the particular experiments for each of the normal subjects. It is to be observed that for the first two normal subjects the figures represent the average of tests repeated several times, for the sake of verification, in each particular hour of sleep and as frequently as possible.

The first column indicates the hour of sleep at which the experiment was made, the second gives the value corresponding to the first *subconscious reaction*, the third, that corresponding to the *waking-point*.

Cases were found where the entire range of the esthesiometer was insufficient to produce awakening. In such cases it was necessary to bring a second excitation to bear upon the subject; that is, it was necessary to recommence the pressure and continue it until, as a result of the summation of excitations, the awakening was effected. Similarly, it sometimes happened that the regular course of the esthesiometer was interrupted by a vigorous (unconscious) withdrawing movement on the part of the sleeper; it was then necessary, as in the other cases, to recommence the pressure after a short pause and proceed with it till he awoke. The former case is indicated in the third column by numbers joined by a plus sign (+), the latter oy figures separated by a comma. Finally, in the fourth column are placed the data respecting dreams obtained from questions put at the time of the experiment, that is, as soon as

the subject was awake; affirmative answers are indicated by a plus sign (+), negative by a minus sign (—), doubt by an interrogation point (?).

From these experiments, by joining the several waking-points, we were able to obtain a *curve of the depth of sleep*. With this curve we give another, which shows the manner in which the *subconscious reaction* varies; and we might easily have added still a third, the *curve of dreams*, had it not seemed to us somewhat inappropriate to place numerical data and data gathered from the putting of questions in one and the same graphic representation.

Normal subject O. N., male, aged 15; rather delicate constitution, but healthy. Temperament excitable, somewhat impulsive. Sleep usually deep and regular. Seldom wakes up in the night. Is accustomed to fall asleep soon after going to bed. Is not a good dreamer; always remembers his dreams, which are, however, for the most part trivial.

TABLE I.—NORMAL SUBJECT O. N., MALE.

EXPERIMENTS WITH SHARP POINT OF THE ESTHESIOMETER.

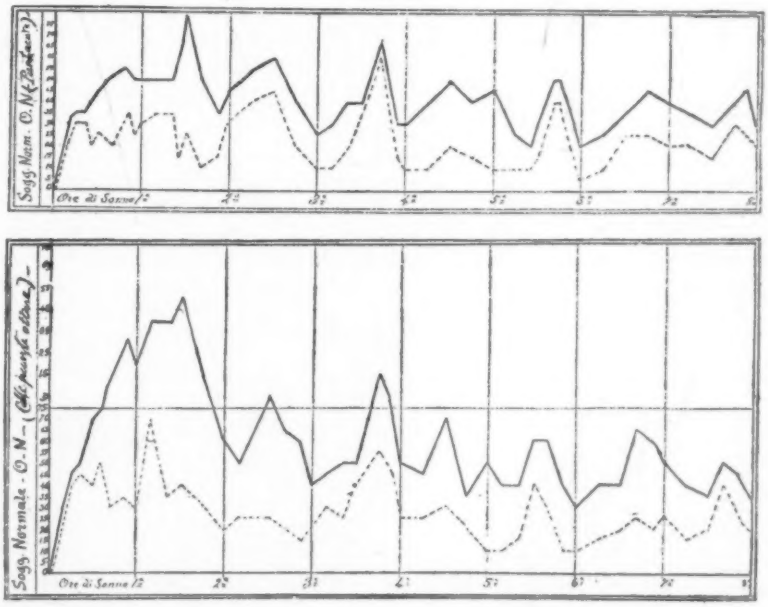
Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.	Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.
0.10	20	30	—	3.40	60	65	+
0.15	30	35	—	3.50	15	30	?
0.20	30	35	—	4	10	30	—
0.25	20	40	—	4.15	10	40	—
0.30	25	45	—	4.30	20	50	—
0.40	20	50	—	4.45	15	40	—
0.50	35	55	—	5	10	45	+
0.55	25	50	—	5.15	10	25	+
1	30	50	—	5.25	10	20	+
1.10	35	50	—	5.30	15	30	?
1.20	35	50	—	5.40	40	50	+
1.25	15	65	—	5.45	40	50	?
1.30	25	25, 55	—	5.55	10	30	+
1.40	10	50	—	6	5	20	?
1.50	15	35	+	6.15	10	25	+
2	30	45	—	6.30	25	35	?
2.15	40	55	?	6.45	25	45	+
2.30	45	60	+	7	20	40	+
2.45	20	40	—	7.15	20	35	+
3	10	25	?	7.30	15	30	+
3.10	10	30	—	7.45	30	40	—
3.20	20	40	—	7.50	25	45	—
3.30	35	40	+	8	20	30	—
				8.15	20	30	+

TABLE II.—NORMAL SUBJECT O. N. (THE SAME).

EXPERIMENTS WITH BLUNT POINT OF THE ESTHESIOMETER.

Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.	Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.
0.10	20	30	—	4	25	50	?
0.15	40	45	—	4.15	25	45	—
0.20	45	50	—	4.30	30	70	?
0.30	40	70	—	4.45	20	35	+
0.35	50	75	—	5	10	50	+
0.40	30	30, 55	—	5.10	10	40	+
0.50	35	35, 20, 50	—	5.20	15	40	—
1	30	30, 20, 45	—	5.30	40	60	+
1.10	70	70, 30, 15	—	5.40	30	60	+
1.20	35	35, 45, 40	—	5.50	10	40	+
1.30	40	40, 30, 20, 35	—	6	10	30	+
1.45	30	75 + 15	—	6.15	15	40	+
2	20	60	—	6.30	20	40	+
2.10	25	50	?	6.40	25	65	+
2.30	25	25, 35, 20	+	6.50	20	60	—
2.40	20	20, 45	—	7	25	50	+
2.50	15	60	—	7.15	15	40	—
3	20	40	—	7.30	20	35	—
3.10	30	45	—	7.40	40	50	+
3.20	25	50	+	7.50	25	45	—
3.30	40	50	+	8	20	35	+
3.45	55	55, 20, 15	+	8.10	25	30	—
3.50	45	45, 25, 10	—	8.20	35	50	+

FIG. 2.



Note in subject O.N. that the maximum depth is reached in the first half of the second hour. Note also the infrequency of dreams in the first half and their relative frequency in the second half of the sleep period. (Compare Fig. 2.)

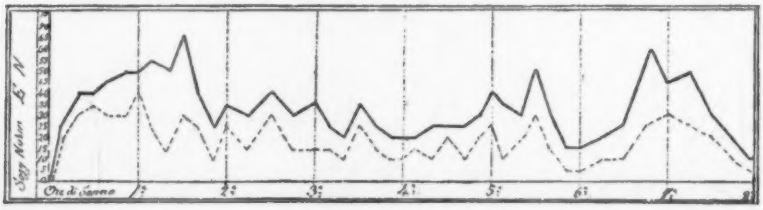
Normal subject E. N., female, aged 21; good constitution, at the time slightly debilitated from study, somewhat emotional; intellect and memory very good. Sleeps rather lightly; wakes up easily during the night; ordinarily falls asleep a considerable time after going to bed. Has frequent dreams and remembers them well.

TABLE III.—NORMAL SUBJECT E. N., FEMALE.

Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.	Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.
0.10	20	25	—	4.10	15	20	—
0.20	30	40	—	4.20	10	25	+
0.30	35	40	+	4.30	20	25	+
0.40	30	45	—	4.40	10	25	+
0.50	30	50	?	4.50	20	30	+
1	40	50	—	5	25	40	+
1.10	25	55	+	5.10	10	35	+
1.20	15	50	—	5.20	20	30	+
1.30	30	65	?	5.30	30	50	+
1.40	25	30	+	5.40	15	30	+
1.50	10	25	+	5.50	5	15	+
2	25	35	+	6	5	15	+
2.15	15	30	+	6.15	10	20	+
2.30	30	40	+	6.30	10	25	+
2.45	15	30	?	6.45	25	55	+
3	15	35	?	7	30	45	+
3.10	15	25	+	7.15	25	50	+
3.20	10	20	+	7.30	20	30	+
3.30	25	35	+	7.45	10	20	+
3.40	15	25	+	8	5	10	+
3.50	10	20	+	8.15	10	15	+
4	10	20	+	8.30	10	15	—
				8.45	5	10	+

Note in normal subject E. N. that the depth of sleep attains its maximum after an hour and a half of sleep; that in the period between six and a half and seven and a quarter hours the depth is considerable. Dreams vary at first and become frequent in the succeeding hours until morning. (Compare Fig. 3.)

FIG. 3.



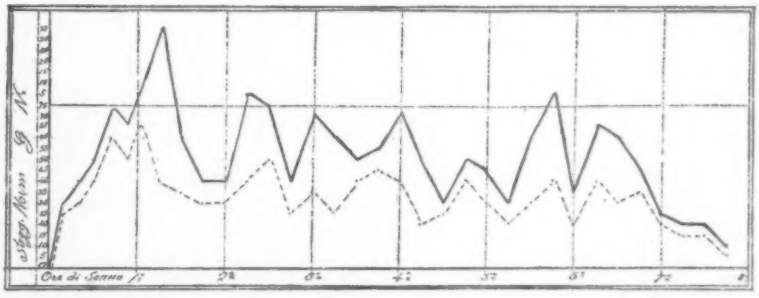
Normal subject G. N., male, aged 60; very robust constitution, mentally normal. Sleeps soundly during the early part of the night. In the latter part of the night wakes easily. Falls asleep soon after going to bed. Is a good dreamer and remembers his dreams fairly well.

TABLE IV.—NORMAL SUBJECT G. N., MALE.

Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.	Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.
0.10	25	30	—	4	40	70	+
0.20	30	40	?	4.15	20	50	+
0.30	40	50	+	4.30	45	30	+
0.40	60	70	+	4.45	40	50	+
0.50	50	65	+	5	30	45	+
1	65	65, 15	?	5.15	20	30	+
1.15	40	40, 60, 10	+	5.30	30	60	+
1.30	35	60	+	5.45	40	40, 40	+
1.45	30	40	—	6	20	35	+
2	30	40	+	6.15	40	65	+
2.15	40	40, 40	—	6.30	30	60	+
2.30	50	75	+	6.45	35	55	—
2.45	25	40	+	7	20	25	—
3	35	35, 35	+	7.15	15	20	+
3.15	25	60	+	7.30	15	20	+
3.30	40	50	+	7.45	10	15	—
3.45	45	55	+				

Note in normal subject G. N. that the maximum depth is attained at the beginning of the second hour; that it is quite marked also in the period between five and a half and six and a half hours. Dreams were noted in almost every experiment. (Compare Fig. 4.)

FIG. 4.



Normal subject An. N., female, aged 55; robust physical constitution. Quiet temperament. Sensibility and intellect normal. Is accustomed to fall asleep soon after going to bed. Generally sleeps well; her sleep does not ordinarily extend

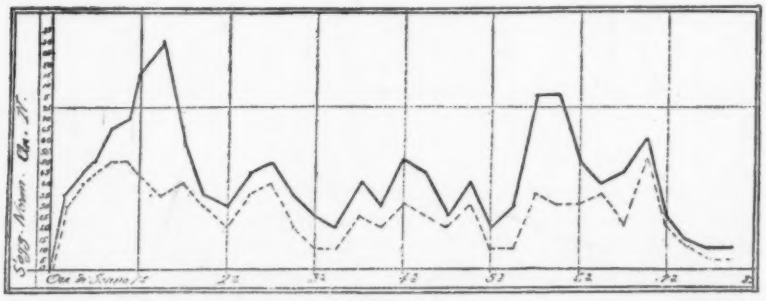
beyond eight hours. Dreams frequently and has a good memory for dreams.

TABLE V.—NORMAL SUBJECT An. N., FEMALE.

Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.	Hour of Sleep.	Subcon. Reaction.	Waking Point.	Dreams.
0.10	30	35	+	4	30	50	+
0.20	40	45	+	4.15	25	45	+
0.30	45	50	+	4.30	20	25	+
0.40	50	65	+	4.45	30	40	+
0.50	50	70	?	5	10	20	+
1	45	45, 45	+	5.15	10	30	+
1.15	35	35, 40, 30	+	5.30	35	35, 45	+
1.30	40	60	—	5.45	30	30, 50	+
1.45	30	35	+	6	30	50	+
2	20	30	+	6.15	35	40	+
2.15	35	45	—	6.30	20	45	+
2.30	40	50	+	6.45	50	60	+
2.45	20	35	+	7	20	25	+
3	10	25	+	7.15	10	15	+
3.15	10	20	+	7.30	5	10	+
3.30	25	40	+	7.45	5	10	—
3 45	20	30	+				

Note in normal subject An. N. that the maximum depth is reached at the beginning of the second hour of sleep, and that it is also considerable in the sixth and seventh hours. Dreams are very frequent; they occur even when the depth of sleep is at its maximum. (Compare Fig. 5.)

FIG. 5.



The tables dealing with the measure of sleep in the five pathological subjects are very complex, since it seemed desirable to note (1) not only the moment at which the first reflex movement on the tactile-pressure excitation appeared, but also the nature and extent of such movement; (2) the phenomena accompanying complete awaking; (3) recollection of dreams

and, where recalled, their content; (4) convulsions and any other pathological phenomena observable in the subject on the day preceding the night of experiment, etc.; besides many other matters which are of no direct interest to the readers of this REVIEW.

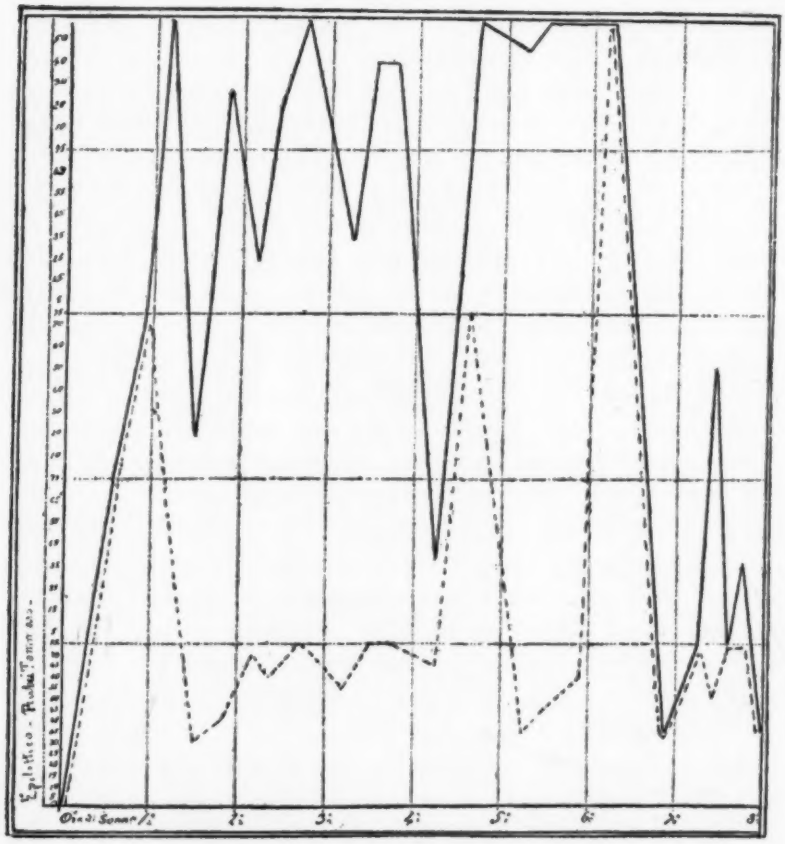
For this reason we shall make a descriptive report of the observations without giving tables, and shall reproduce here the graphic representation only, showing the curves of the depth of sleep and subconscious reaction.

Tommaso Rubei, aged 33. In childhood he had typhoid; was early given to self-abuse. About his eighth year he began to have attacks of vertigo, but without loss of consciousness. At the age of 15 he experienced a great fright, and two years later began to have convulsions, which at first were very frequent and closely connected with atmospheric changes, and which gradually became rarer. For several years they have appeared every 20, 30 or 40 days; but attacks of petit mal and vertigo are also not infrequent. These attacks occur almost without exception at night and are sometimes preceded by a feeling of tightening at the throat; the attack consists of tonic and clonic convulsions lasting from 5 to 8 minutes followed by coma and deep sleep. Movements and sensibility are normal, secretions of sweat abundant and easily provoked; the pupillary reaction is slightly tardy; the knee-jerk is more pronounced on the left side, while the epigastric reflex appears only on the right. His demeanor is ordinarily quiet, temperament somewhat depressed. Outbursts of anger are frequent, memory somewhat feeble. His intellectual gifts are slight.

Rubei usually sleeps well and without waking up in the course of the night; his sleep is quiet and sound. According to patient's report he dreams every night, generally of pleasant things, sometimes about matters connected with his daily life, members of his family, etc. Formerly he was often troubled with erotic dreams, followed by pollution. He does not remember whether previous to his illness his sleep exhibited any phenomena of special interest. Ordinarily he does not notice any alteration in sleep before an attack; but in the past he sometimes had terrifying dreams.

His recollection of dreams generally varies much, especially with atmospheric conditions (?); he declares that he can not recollect them at all on mornings after wet or rainy days. At other times, he says, he remembers them very well and to the minutest particulars, but he is seldom able to relate them with any great clearness.

FIG. 6.



See Fig. 6. The curve shows that Rubei's sleep is of extraordinary depth, and that it continues deep with few oscillations till he awakes.

The line representing subconscious reaction shows great differences of proportion with the curve of depth in the third and fourth hours of sleep.

It is a noteworthy fact that to awaken him it is almost always necessary to employ a number of stimuli and to push them to the maximum several times, while in the other subjects this is only exceptionally the case. Moreover, the subconscious reactions were for the most part feeble and entirely out of proportion to the intensity of the stimulus—slight movements of the head, more or less marked wrinkling of the brow, sometimes movements of the hand, as if to brush the stimulus away from the head. Awakening did not occur generally till several seconds after the last stimulation; the subject was unable to state the number of times he had been touched, but several times he declared that he had been aware of a vague feeling of discomfort on the forehead. He usually fell asleep again a few minutes after the awakening was accomplished.

In contrast with the other patients, who generally fall asleep soon after going to bed, Rubei usually remains awake for half an hour or longer. As regards the effect of the epileptic attacks upon his sleep little can be said, inasmuch as in the month of experiment they occurred but three times during the night; from experiments made March 11, 1901, at 10:35 p. m., twenty minutes after an attack (after 1 h. 30 m. of sleep), and March 22, 1901, at 1 a. m., fifteen minutes after an attack (after 4 h. 15 m. of sleep), it appears that the waking-point is lowered in comparison with the same hour on other nights without attacks. On the other hand, the waking-point remained very high when the experiment was made 1 h. 25 m. after the attack (March 23, 1901, after 4 h. 45 m. of sleep).

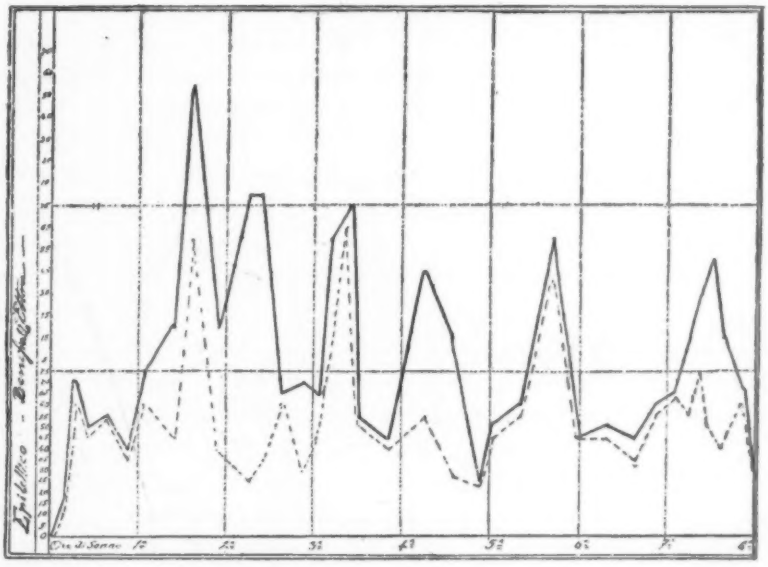
From questions put to him regarding his dreams it appeared that, even when Rubei declared that he dreamed, he was unable for the most part to relate at all in detail the subject of the dream. Altogether, in a total of 28 experiments, twice he was able to relate his dream, 9 times he recalled the subject in a general way, always as 'pleasant' in character, 7 times he did not dream at all, and 10 times he was uncertain whether he had dreamed or not. The strangest feature is that the two times when he recollected the dream fairly well were in experiments following close upon the beginning of sleep. Of the other dreams, three occurred in the first four, and six in the last four hours of sleep.

Ettore Benefialle, aged 24. In childhood he was subject to rather frequent convulsions, the attacks at times lasting throughout the day. Later they became less frequent, but were supplemented by attacks of petit mal (vertigo and sudden loss of consciousness). At present the severe chronic attacks occur very seldom; on the other hand, mild attacks are more or less frequent. The attack is preceded by an aura consisting of a tingling sensation in the right hand with clouding of vision. It lasts 4 or 5 minutes with tonic and clonic shocks, more powerful on the right side than on the left, followed by a state of coma; there is generally no frothing at the mouth. The mild attacks consist in a clouding of vision—'the light goes away from his eyes'—he sees, as it were, a ball of white flame, which hovers before his eyes, causing much discomfort; he feels as if his body were split in two in the middle. All this generally lasts for a few seconds. Afterwards he feels torpid, and if the attack occur at night he dare not go to sleep afterwards, 'for fear the trouble might come on again.' The attacks occur by day as well as at night, but more frequently at night. There is a slight defect of hearing, and of smell on the right side. The tactile sensibility appears to be less on the right side. Visual acuteness is also inferior, especially on the right. The knee-jerk is normal. Mental capacity inferior. Temperament liable to variations without apparent reason; B. is quiet and very devout; he is addicted to pederasty.

B. usually sleeps well; his sleep is quiet and sound; if he happens to wake in the course of the night he falls asleep again immediately; he says that he has sometimes waked up with a start as a result of terrifying dreams, crying out in fear and calling to the attendants for help. He ordinarily dreams every night, but when he has one of the severer attacks during the night he does not dream at all. In general his dreams are pleasant, sometimes they are strange and terrifying; quite frequently, especially in recent times, erotic dreams occur, which are repeated several times in succession, almost always in the same way, followed in the majority of cases by pollution, and he wakes up with a pleasant impression. He also dreams, though not often, of things that have happened in

the course of the day or in preceding days. He says that he has always dreamed, and that he observes no difference in his manner of sleeping on account of the disorder to which he is subject. When his dreams are terrifying he retains a vivid impression, and continues in fear during the day, dwelling on them often. He generally remembers his dreams well; but when attacks occur, even the milder ones, and he chances to dream, he does not remember the subject of his dreams at all.

FIG. 7.



See Fig. 7. The curve for the depth of sleep throughout its course is high as a whole, but does not reach the elevation of Rubei's. The course of the line of subconscious reaction maintains a fairly constant proportion to the curve of depth; the least constancy of proportion occurs at the beginning of the third and fifth hours of sleep. In his case also the first reaction to the stimulus was almost always slight. In waking, the return of consciousness was rapid, so that the subject was always in condition to answer pertinently the questions asked him as soon as he was awake.

During the month and more in which B. was subject to our experiments the epileptic attacks occurred but once in the classic form, and this was at night; the other times they were mild and of very short duration. In an experiment made 20 minutes after the severe attack his sleep was found to be much deeper than in the corresponding hour of other nights free from attacks (after 30 minutes of sleep). In five other experiments also made after attacks the depth was notable (after 2 h. 15 m., 3 h. 20 m., 4 h. 15 m., 5 h. 20 m., and 7 h. 15 m. of sleep), but without much deviation from the normal mean. The patient, on the other hand, asserts that his sleep is not so sound after the attacks.

From the observations made with reference to his dreams it appears that, contrary to what Benefialle asserts, namely, that he dreams every night, 22 times he did not dream at all, while 16 times he claims to have had dreams; the dreams were in general trival, sometimes erotic; his recollection of them at the time was very cursory, but on the following morning he was able to describe the dream in greater detail (*paramnesia onirica?*). The greatest frequency of dreaming occurred between the second and fourth hours of sleep; there were no dreams (except once, after 1 h. 5 m. of sleep) in the first two hours; there were very few in the latter half of the sleep period, though they were somewhat more frequent towards the end.

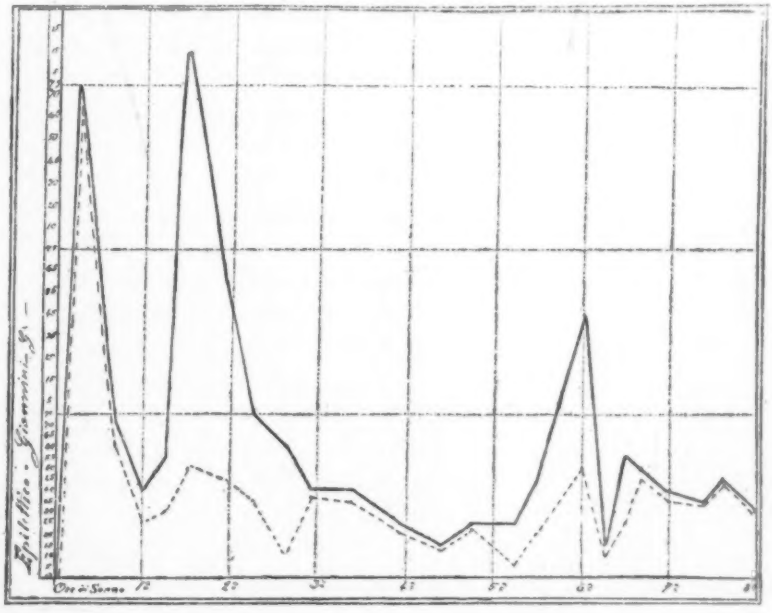
Gioacchino Giannini, aged 18. About his sixth year, in trying to avoid the wheel of a cart, he was caught between it and the guard, receiving a rather severe injury on the head; taken to the hospital, he recovered consciousness after 48 hours and did not suffer any ill-effects during the 25 days which he spent at the hospital. For seven or eight years he was perfectly able to pursue his work, when suddenly one night, without any reason for it, he was seized, while in bed, with tonic and clonic convulsions on the left side; a week later the attack was repeated in the same way, and from then on they recurred every 30 or 40 days. At the end of two years he was operated upon. Following the operation (raising of the right parietal bone which was somewhat depressed) there were no more attacks for about three months. But as the result of an injury received upon the scar the convulsions reappeared in the same

form as before, once or twice a month, and have recurred incessantly since. The patient says that he feels himself drawn sharply toward the left, he calls for help and lies on the bed or sits down so as not to injure himself during the attack; the latter is generally severe and always more violent on the left side, but of short duration, with rapid return of consciousness. In general the attacks occur by day or about evening while he is going to bed, almost never during sleep. Nothing else worthy of note.

Giannini is a sound sleeper; according to his report he seldom wakes in the course of the night; only once in 5 or 6 days do dreams occur; their content is generally of little interest; they are sometimes terrifying, occasionally erotic. He says that when he has had one of his attacks during the day he sleeps more soundly and does not dream at all. He is not aware of any differences in his sleep since he has been subject to the attacks from when he was in good health.

See Fig. 8. In this case the curve of sleep shows a course which is quite unique; it quickly reaches a very high point

FIG. 8.



within the first half hour, descending quite as rapidly in the second half hour. It rises again, reaching the maximum after an hour and a half; it then falls gradually, only to rise again to a notable height about the end of the sixth hour, thereafter maintaining itself at a medium level till the time of waking. In the majority of tests, except in the periods of greatest depth, the subconscious reactions were rather marked, even for slight stimuli, and preceded the awaking by a small margin only. Patient had but two epileptic attacks, which occurred, as usual, in the day time, and did not affect his sleep. There is little to note with respect to his dreams, Giannini not being a good dreamer, and giving affirmative answers three times only.

Luigi Moriggi, aged 51; contracted syphilis at a very early age. In June, 1899, the symptoms of the present disorder set in; pains in the head, continual somnolence during the day, neglect of his duties, foolish outlay of money, pilfering the property of others, exalted ideas of his own importance, disorders of memory and speech, etc. He entered the asylum at Rome, October 19, 1899.

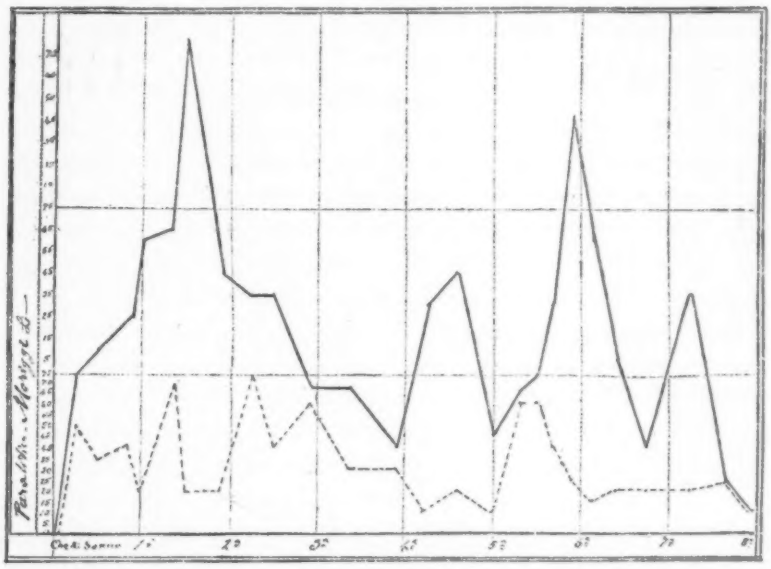
The pupils are unequal in size, reaction slow, tremors, rapid exhaustion of the facial muscles, tongue, fingers, etc.; slight indication of Romberg's sign, exaggeration of the deeper reflexes, diminution of the superficial ones, normal tactile sensibility. Demeanor apathetic, mild euphoria, wild ideas (hazy and vague) of his own greatness, affective side deficient, critical side exceedingly deficient; memory weak. Diagnosis of *dementia paralytica*.

M.'s sleep is usually light and often interrupted; he dreams but seldom, sometimes about members of his family or trivial matters. Before his illness he slept well and without interruption; he says that he dreamed more frequently then than now, but without ever being much of a dreamer. The few dreams which he has at present he does not remember at all.

See Fig. 9. The figure shows that the depth of sleep mounts rapidly at the beginning of the first hour of sleep, keeps on increasing slowly and continuously till the first half of the second hour, and then decreases with oscillations till the sixth

hour, at the end of which there is a decided rise. The depth is above the normal in this subject also.

FIG. 9.



Somewhat more variable is the line of subconscious reaction; it is conspicuously low in the second half of the sleep period, except in the fifth hour. The reactions were generally few and feeble; but before awakening was effected it was necessary to repeat the excitation at least twice. There is nothing to note regarding his dreams, Moriggi never having mentioned a single dream during the period of experimentation.

Francesco Bechelli, aged 16. His mother suffers from hystero-epileptic convulsions. He is very capricious; has always shown a perverse and unruly character, resisting his mother and sister, going even so far as to draw a knife upon them. He often runs away from home, after stealing some objects and selling them for a few *sous*, which he spends in amusement. He often sleeps in the street or a gateway, resisting the police when they endeavor to take him back home. Has several times attempted suicide. The pupillary reaction is good, the conjunctival and pharyngeal reflexes are wanting;

the knee-jerk is vigorous, other reflexes normal. There is hypesthesia of the right side of the trunk and also of the lower left limb. Amblyopia is present on the right side, hypacousia and anosmia on the left, hyperesthesia in the inguinal region. His demeanor is quiet. Decided deficiency in mental gifts, childish ideas, lack of capacity for concentration; ethical sensibility very blunt. He speaks with complacency of his own debauchery; of many of the deeds of which he is accused he has no recollection whatever, of others he admits the authorship and boasts of them. He is addicted to swearing and is exceedingly fond of indecent language. The patient has both mental and motor crises. Diagnosis of *degeneration and moral insanity*, probably *hystero-epilepsy with distinct crises*.

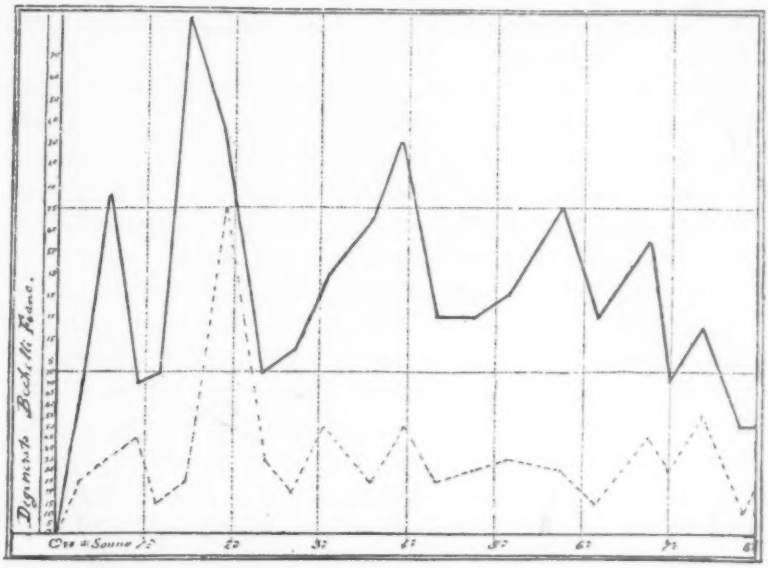
He is a sound sleeper; if he wakes up before midnight he goes to sleep again quickly, if it is near morning he remains awake and if at home gets up and goes out. For the past three or four years he has dreamed very little, previous to that more frequently; his dreams are generally pleasant, but formerly he often dreamed of being pursued by his parents seeking to beat him, or by the police, and would awake with a start. At other times he thought he saw wild beasts under the bed seeking to attack him: then he would feel, as it were, a blow on the head and wake up terrified (De Sanctis's *dream equivalent of attack*). At present, he says, when such a dream occurs he wakes up quickly, realizing that it is a dream, while if the dream is pleasant he remains asleep. His sleep has never shown any notable changes in connection with his disorder, except that, as mentioned above, dreams occur much less frequently, and that without being especially impressed by them he generally remembers them well.

See Fig. 10. His sleep increases rapidly in intensity during the first half hour; the curve attains its highest level in the second hour; then it descends, only to rise again and remain at a high level, but with oscillations which continually diminish in height till the time of waking, without exhibiting any noteworthy elevation in the second half of the sleep period.

The curve of subconscious reaction is seen to be less variable; except for a marked elevation in the second hour of

sleep it remains at rather a low level, with few oscillations. The reactions are somewhat energetic, but notwithstanding this there is no clear sign of waking until after repeated stimuli which, in the mean, if taken separately, would not reach a high degree of intensity.

FIG. 10.



His dream activity is very slight; only four times was an affirmative answer given—in experiments made after 2 h. 20 m., 5 h. 45 m., 8 h. 10 m., and 8 h. 45 m. of sleep—that is, once in the first and three times in the second half of the sleep period.

During the time when Bechelli was subject to experiment nothing was observed on either the mental or the motor side which seemed to exert a real influence on the course of his sleep.

Comparing the curves obtained from our normal subjects with the curves given by the authors cited at the beginning of this article, some rather notable differences appear at once.

As we have seen, the maximum depth falls, according to Kohlschütter, within the first hour of sleep, according to Mönninghoff and Piesbergen in the third quarter of the second hour,

according to Michelson at the end of the first, and about the same according to Czerny; while according to our observations it falls within the first half of the second hour. This would be in accord rather with the observations of Lambranzi. The diversity of results should be attributed, however, not so much to method as to individual factors, the authors mentioned having found that the point is sometimes earlier, sometimes later, according to the subject.

But where the curve of depth of sleep obtained by our method differs most notably from the others is in its later course; for while according to Kohlschütter and Michelson it descends continuously and rapidly till the time of waking, and according to Mönninghoff and Piesbergen, Czerny, and more especially Lambranzi it exhibits a marked elevation in the second half of the sleep period, according to our observations, on the contrary, the curve, although following in general a descending course, does not have a uniform path, but exhibits marked oscillations, with a maximum and minimum for each hour of sleep. The *secondary rise* of the curve appears clearly in three subjects and lasts for an hour and a half; it occurs earliest in the subjects G. N. and An. N., who are accustomed to sleep from 7 to 8 hours at the most, and later in the subject E. N., who habitually sleeps longer. The fact that we did not discover any such rise in the subject O. N., who is not much of a dreamer, appears to confirm Lambranzi's hypothesis, according to which the secondary rise is due to a real increase in the depth of sleep in connection with greater dream activity. But we shall see presently that Lambranzi's hypothesis seems to be contradicted by other facts. It appears evident, then, that each subject has a curve peculiar to himself, which differs both in elevation and in course from the others. That the depth of sleep is not the same in all individuals has been known, indeed, from the earliest times; age, sex, constitution, state of health, etc., are all factors which may cause it to vary, apart from factors extraneous to the organism which may act for a longer or shorter time on the sleeper.

Analysis of the curves of the abnormal subjects brings out noteworthy points regarding the general course of the depth of sleep and the intensity to which it attains.

The fact which stands out first of all is that in all five of the pathological subjects the depth of sleep is far greater than among the normal subjects. In the epileptic *Rubei* sleep is extraordinarily deep; in the two other epileptics, *Benefialle* and *Giannini*, although deep, it does not reach the level found in Rubei's case. In the paralytic *Moriggi* and the degenerate *Bechelli* sleep maintains throughout its course a depth at least double that of the normal cases.

As regards the epileptics, these researches completely confirm some investigations made by one of us, who found that, contrary to the assertions of most authors that all neuropaths, including epileptics, have a restless and light sleep, as a matter of fact sleep was very deep in the majority (60 per cent.) of the cases of epilepsy with the classic symptoms. In the subject *Rubei*, moreover, confirmation is found of another fact also noted by one of us, that with increase in age of the patient and length of standing of the disorder sleep becomes much deeper. As a matter of fact, Rubei is the oldest of the three epileptics and has been the longest time an invalid.[1]

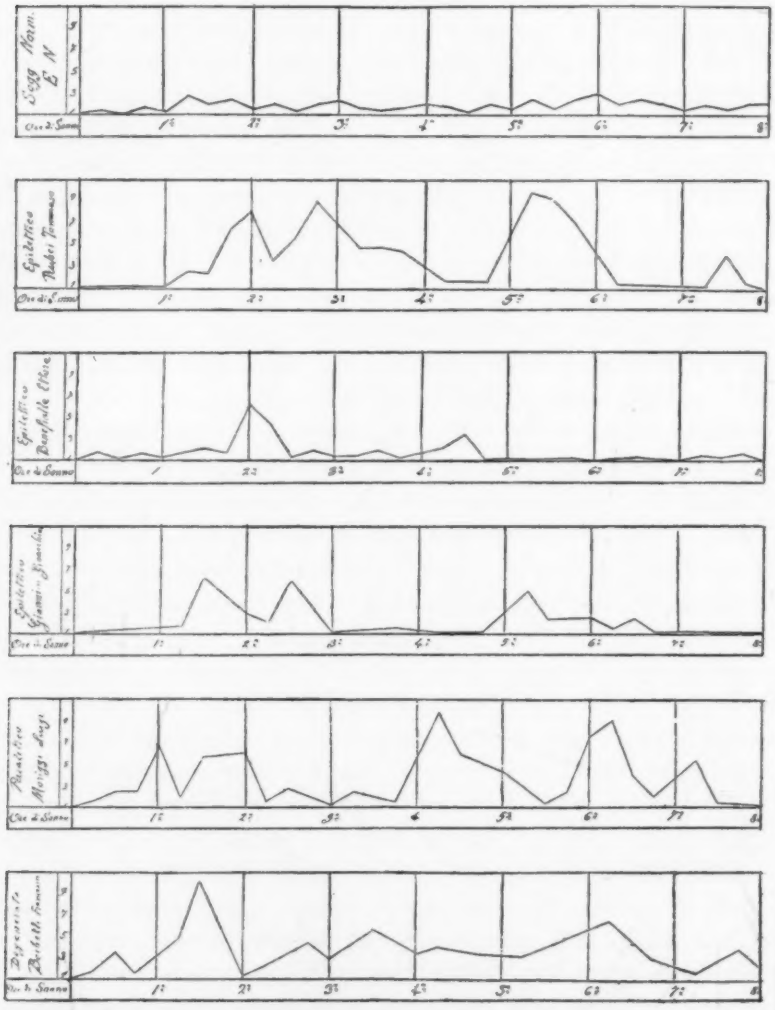
As to the maximum depth of sleep, in all the psychopaths, as in the normal cases, it falls in the first half of the second hour.

Examining the course of the curves for the psychopaths, we find that they differ among themselves much more than those of the normal subjects. In two only, *Benefialle* and *Bechelli*, does there occur a continuous lowering of height with continual oscillations, proceeding till the time of waking, while in the other three the curve presents peculiar characteristics. In the two epileptics *Rubei* and *Giannini* the oscillations are much fewer, but while in the former the depth is very great throughout, in the latter it remains at a much lower level. The curve of the epileptic *Benefialle* is the one which, as regards type, accords most with the normal, becoming continually lower, with oscillations, as the time of waking approaches; the curve of *Bechelli* comes next. In the paralytic *Moriggi* we find a type of curve which is more in accord with such normal curves as show a marked rise in the second half of the period. As to this rise, which we have termed *secondary*, the fact is to be

[1] Cf. De Sanctis: 'Die Träume,' etc.

noted that the two subjects in whom it appears most prominent are not dreamers at all, which does not bear out Lambranzi's hypothesis, at least for psychopaths; while, *per contra*, the two subjects who dream most frequently, *Rubei* and *Benefialle*, do not show it in any marked degree.

FIG. 11.



Relation between Subconscious Reactions and Waking-point in the Normal and Pathological Subjects.

TABLE VI.—RATIO BETWEEN SUBCONSCIOUS REACTION AND WAKING-POINT.

Hour of Sleep.	Normal.				Psychopathic.				
	E. N.	An. N.	G. N.	O. N.	Rubei.	Benefialle.	Giannini.	Moriggi.	Bechelli.
0.15	1.15	1.14	1.26	1.30	1.00	1.55	—	1.50	1.71
0.30	1.00	1.11	1.25	1.45	1.00	1.05	1.00	2.42	3.42
0.45	1.53	1.30	1.23	1.65	1.00	1.70	1.13	2.50	1.55
1	1.25	2.00	1.28	3.18	—	1.25	1.60	6.75	—
1.15	2.75	3.00	2.75	1.30	2.55	—	1.83	1.92	5.00
1.30	2.18	1.50	1.42	3.12	2.40	2.11	6.20	5.62	10.10
1.45	2.50	1.16	1.33	3.00	6.33	1.92	—	—	—
2	1.50	1.50	1.33	3.00	8.12	6.20	3.00	6.00	1.23
2.15	2.00	1.28	2.00	2.33	3.57	4.42	2.14	1.46	2.14
2.30	1.33	1.27	2.50	3.20	5.33	1.18	6.00	2.75	—
2.45	2.00	1.75	1.60	3.62	9.06	1.90	—	—	4.25
3	2.33	2.00	2.00	2.00	—	1.48	1.00	1.16	3.00
3.15	1.83	2.00	2.40	1.75	4.74	1.50	1.14	2.33	—
3.30	1.40	1.60	1.25	1.25	4.85	1.83	—	—	5.80
3.45	1.83	1.50	1.22	1.77	4.54	1.12	1.55	1.33	—
4	2.00	1.66	1.75	2.00	—	—	—	—	3.60
4.15	1.91	1.80	2.50	1.80	1.84	2.08	1.00	10.50	4.00
4.30	1.15	1.25	1.50	2.33	—	3.60	—	6.00	—
4.45	2.00	1.33	1.25	1.75	1.80	1.00	1.00	—	3.30
5	1.60	2.00	1.50	5.00	—	1.11	—	4.50	—
5.15	2.50	3.00	1.50	4.00	9.85	1.09	5.00	—	3.14
5.30	1.66	2.28	2.00	1.50	9.22	—	2.25	1.25	—
5.45	2.50	2.66	2.00	3.00	7.00	1.17	—	2.62	5.00
6	3.00	1.66	1.75	3.00	—	1.00	2.40	7.60	—
6.15	2.00	1.14	1.65	2.66	1.23	1.11	1.50	9.00	6.60
6.30	2.50	2.25	2.00	2.00	1.08	1.28	2.20	4.00	—
6.45	2.20	1.20	1.85	2.80	1.00	1.09	1.10	2.00	3.00
7	1.50	1.25	1.25	2.00	—	1.00	1.14	—	2.33
7.15	2.00	1.50	1.33	2.66	1.09	1.63	—	5.50	1.72
7.30	1.50	2.00	1.33	1.75	4.00	1.50	1.10	1.00	—
7.45	2.00	2.00	1.50	1.52	1.64	1.65	—	—	4.00
8	2.00	—	—	1.75	1.00	1.06	1.60	1.00	2.00

If, now, we turn our attention to the curves of subconscious reaction, we observe at once that they do not take a course constantly proportional to the curve of waking; now they approach, now they recede from the latter. Other observers have already noted that the reflexes have various modes of action during sleep; thus Marie de Manacéïne maintains that in sleep the reflexes are more vigorous and quicker to act than in waking, being no longer 'réprimés et maîtrisés par la vie cérébrale consciente'; this view is contradicted by Tarchanoff, who, after cutting the spinal cord of young dogs above the lumbar region, found that the reflexes in the hind legs, which then depended on the cord alone, did not alter notably from the waking state, while

those of the front legs, which were still under the control of the brain, underwent very marked diminution. This hint will suffice to show how important is the analysis of the curve of subconscious reaction in all our subjects.

How much higher a ratio between subconscious reaction and waking-point is maintained in the psychopaths than in the normal subjects, is shown numerically in Table VI. and graphically in the curves. (Compare Table VI. and Fig. 11.)

It is readily seen that the disproportion between the curve of the waking-point and that of subconscious reaction does not become very accentuated in the normal subjects. During the first hour of sleep in all the subjects, both normal and psychopathic, the ratio between subconscious reaction and awaking is very small and nearly uniform for the entire hour, which would go to show that the reflex activity remains at a very high threshold; while in the next hour the ratio in every case takes a very much higher value, and it is precisely in this hour that the depth of sleep reaches its maximum. In the succeeding hours we find that the course of the curve of subconscious reaction is less regular among the psychopaths than among the normal subjects. In the epileptic *Rubei*, in whom the depth of sleep is greatest, we also find the greatest difference between the two curves; it is worthy of mention that the ratio remains at a very high level for two thirds of the duration of sleep. In *Benefialle*, on the contrary, the differences between the two curves are, in general, not at all marked. They are rather more marked in *Bechelli*. In *Giannini* the greatest difference occurs between the first hour and a half and the second hour and a half; in *Moriggi* a maximum difference occurs not only between the first half hour and second hour of sleep, but also in connection with the secondary rise of the waking curve (sixth hour). As regards dreams, it is important to note that they occur in every period of sleep, even at the beginning, *i. e.*, when the depth is greatest; but they are more frequent and more vivid in the later hours of the night, particularly towards morning. As to the modifying influence of external stimuli on the course of dreams, we were several times able to note it. Thus the subject An. N. related that while she was dreaming of chatting with acquaint-

ances and was about to leave the house, of a sudden she was seized with a violent headache, so that she was compelled to turn back. (Precisely at that moment the experiment was being performed, as usual, with pressure on the forehead.) Another time the subject E. N. told of feeling as if she had just been bitten by a large spider. Similarly, O. N. dreamed several times of being engaged in a fight with other persons and of receiving a blow on the head with a stick or knife; etc.

The dream activity of the psychopaths, on the other hand, is slight. It is *nil* in the paralytic *Moriggi* and very small in the degenerate *Bechelli* and the epileptic *Giannini;* in the other two it is somewhat greater.

Further, in the psychopaths dreams occur more seldom in the first half of the sleep period and more frequently in the second; they are generally trivial in character, sometimes erotic, and the memory of them is for the most part very cursory. We were never able to observe any influence of the stimulation on the content of the dream.

It is worth while to note the tendency on the part of one subject to believe himself a greater dreamer than he really is. Are we dealing here, perhaps, with a fact of auto-suggestion ?

As regards the influence of the epileptic attacks on sleep and dreams we can say little, as these occurred very seldom during the period of experimentation. They seemed to exert no noteworthy influence in the case of the psychopaths; in *Rubei* they appeared to produce a diminution in the usual depth, and in *Benefialle* a slight increase. The recollection of dreams is less on nights in which attacks occur.

But our cases are too few to justify our laying stress on general conclusions. Moreover, inspection of the tracings will speak more plainly than any comment which we can make.

A word, in closing, as to the method. It seems to us that the depth of sleep may be satisfactorily measured by the method of tactile-pressure excitations. However, in future researches it will be necessary to employ an instrument with a spring having a greater length of compressibility and bearing, in consequence, a finer numerical gradation. To obtain this it is of course necessary to make certain changes in the ordinary

graduated esthesiometers and algesimeters. One of us is at present engaged in this task, namely, that of constructing a rational and practical *Hypnometer*.

ROME, August, 1901.

NOTE.—An abstract of this article was read by Professor Sante De Sanctis at the Fifth International Congress of Physiology, held at Turin, September 17 to 23, 1901.

DISCUSSION AND REPORTS.

POST-HYPNOTIC SUGGESTION AND DETERMINISM.

In his essay on 'The Dilemma of Determinism' ('Will to Believe,' etc., p. 145), Professor James says: "A common opinion prevails that the juice has ages ago been pressed out of the free-will controversy, and that no new champion can do more than warm up stale arguments which everyone has heard. This is a radical mistake." In agreement with this view the writer purposes to bring up a new line of argument. In the discussion of this question it has been generally agreed that we have nothing in the form of objective evidence to assist us, that, in the very nature of things, such evidence can only be subjective. Thus James, in the essay quoted above (p. 150): "Now, evidence of an external kind to decide between determinism and indeterminism is, as I intimated a while back, strictly impossible to find." So Hyslop ('Elements of Ethics,' p. 217): "The real weakness of the appeal to consciousness is that it can never have more than a subjective or individual value. It could not prove anything except for the individual who has it, and others might not possess any such power," and Simmel ('Einleitung indie Moralwissenschaft,' Band II., S. 306): "Wer es ausspricht (das Urteil, 'unser Geist ist unfrei') muss sich zunächst doch die Anwendung davon auf sich selbst gefallen lassen, und damit zugleich auf die Möglichkeit eines objektiven Nachweises seiner Wahrheit verzichten."

Now may it not be possible that we really *can* find something in the nature of objective evidence to throw new light on this question? If we give a young man, who is sleeping soundly, a slap in the face and see him awake in an instant, are we justified in believing that we know the cause of his waking? If instead, we tickle him until he awakes, have we anything in the nature of objective evidence as to the causes of his waking? Or must we accept his view of it, namely, that he 'simply awoke the same as at any other time?' Now let us take a case of post-hypnotic suggestion. We give the suggestion, and at the time set for its execution, the young man carries it out. Experimenters agree that we can foretell the results, and that the action of the young man has for its determining cause the suggestion given

him. Now is that opinion based on objective evidence or not? But the objection is made that such phenomena should not be considered at all in discussing this problem, that there is a vital difference between the process determining action in cases of post-hypnotic suggestion and that which takes place in cases of 'ordinary' volitional action. It is part purpose of this paper to show that there is no reason for believing that such a difference exists.

Frequently the assertion is made that the subject will fall into a slight hypnosis at the time he executes the suggestion, or that he feels himself acting under compulsion, or that afterwards he forgets about his having done what he did in carrying out the suggestion, or that while he is executing this suggestion he is easily brought to execute other suggestions given then and there. So, for instance, Lipps ('Suggestion und Hypnose,' p. 516): "Auch hier erneuert sich die Hypnose an dem Punkte, oder in dem Bezirke, dem die suggerierte Vorstellung in der Hypnose angehörte." Now the reports of different experimenters do not agree on this point, and in the experience of the writer, the manner in which the suggestion is executed depends upon a variety of factors. We find, for instance, in some cases, that the subject performs the action suggested in a perfectly natural way, in no wise differing from the way in which he attends to anything in his daily routine of actions. Again, we find him hesitating, or at other times still, actually passing through a struggle before executing the suggestion, or even refusing to execute it. Now how account for all this? If the order is, for instance, for him to get up and lie down on a couch after reading the daily paper for a few minutes, he will very probably do this without any sign of wavering on his part, and without there being anything in his manner that would seem in any way strange to those that know him best. If instead, he is asked to walk over to another chair (after reading a few columns) and to sit astraddle of it, facing its back, it is likely that he will show some slight hesitation, or that he will, before carrying out the suggestion, look sheepishly about him to see whether he is being particularly watched. If again, the suggestion is for him to go and lie down on a bed in an adjacent room, it is probable that there will be decided hesitation on his part before executing it, or even that he will not do so at all (unless he be a good subject who has frequently been experimented with). If, to bring out another point, he should be asked to get the hatchet and to break up a valuable piece of furniture, it is very probable that there will be a flat refusal. If asked afterwards in regard to the act suggested, the answers in the different cases will likely be different.

In the first case it may be: "Why, I don't know, it just occurred to me to do so," or something to that effect. In the second case the answer is likely to come: "Why, I just took a notion to," or "I just wanted to" or something of that sort and the subject is apt to show some annoyance in some cases. In the third case, if the action suggested was performed, especially if after a struggle, the subject will frequently recognize the fact that he was acting under suggestion.

It would seem that the nature of the action suggested, the manner in which it is given, and the character of the subject (including bodily state, as fatigue, etc.) are the chief factors that go to determine the results of the experiment. As regards the first factor, it has been the experience of the writer that when the action suggested is such as would in ordinary life be done without much thought and which would be in line with actions performed daily by the subject, it is executed without any hesitation and without any indication of hypnosis on the part of the subject at the time of the execution, and that questioning as to the reason for his having done so or so will generally elicit a response like that above under the first case. He does not seem to care to find out the reason why, in fact frequently doesn't seem to think that there was any reason why. That is to say, this will be the result if the suggestion is not given too forcibly. If the operator makes the mistake of impressing the suggestion too firmly in the mind of the subject, it is likely that it will startle him, thus make him suspicious, and, in many cases, enable him to detect the source; and, in case he should execute it, give him the feeling that he is acting under compulsion. Or, again, when the action to be performed is one that the subject would ordinarily not think of doing, something contrary to a habit of long standing, he will look puzzled or bewildered, will try to put it out of his mind, and yet, after he has once executed the suggestion, it is likely that he will say that he 'wanted to do it,' if asked about it. Of course, the nature of the action suggested, and the manner in which it is given, will not alone determine the result. The intelligence of the subject, his disposition, etc., are important factors. For instance, there are some subjects who, after the action, will always say, with a good deal of emphasis, that they did it because they *wanted* to, even in such cases where they seemed to go through a struggle before doing it. An intelligent subject, especially if he know something about the psychology of the matter, will be very apt to have his suspicions about many ideas that prompt themselves shortly after he has been in the hypnosis (it needs no saying that he will therefore also make mistakes at times).

In a general way, the truth of the matter seems to be this: as regards ordinary, non-moral acts that might come under the head of habitual acts, the testimony of the subject is generally that he didn't know why he did so or so, or that he 'just took a notion to do so,' or that he 'felt like it'; as regards non-moral actions contrary to habitual actions, especially such as seem foolish or distinctly in conflict with the views of the subject, the testimony, in case of an execution of the suggestion, is generally that he 'wanted to do it'; but where something immoral, or, for that matter, anything that is decidedly against the views of the subject, is suggested, the result is apt to be a refusal, and here we have, on the part of the subject, the consciousness of an 'outside' force or power, which seems to be present in the first two cases only when the suggestion given appears in consciousness with an intensity entirely out of proportion to the relative importance of the action suggested, due to a mistake on the part of the operator in impressing the suggestion too forcibly. This, in the mind of the writer, is a fact the importance of which has been somewhat overlooked. If we awake the sleeper by means of a slap he will probably be able to tell what woke him; if by tickling, the chances are that he will say that he awoke 'the same as any other time' (meaning that the cause of his waking was the same). So with post-hypnotic suggestion; if it is properly given the desired result will be obtained; there will be no indication of hypnosis; the subject will not be aware of its origin, and will furthermore tell us that he 'did as he wanted to.' This has been brought out by many experimenters. So, for instance, Bernheim ('De la Suggestion,' etc., p. 46): "L'idée suggéré se présente dans son cerveau à son réveil: il a oublié son origine et croit à sa spontanéité." So also Jordan, Forel, Schmidkunz, Sidis.

The suggestion will then, if the experiments are properly conducted, be executed by the subject under the impression that he *wanted* to do what he does, and, also, that he *could have done otherwise*. On the other hand, we know that suggestion and deed are linked together by a chain of causation admitting of no alternative. It is similarly a familiar fact that the testimony of the subject under the influence of ordinary hypnotic suggestion is to the effect that he could do otherwise than he does. Here we have subjective testimony to the effect that he could do so, and objective proof that he can not. The objection is raised here that this proves nothing for 'ordinary' volitional acts, that he is here acting under compulsion. Now the significant fact is this: He, the subject himself, feels that he is *not* acting under compulsion, that he is acting out of his 'own free will'—meaning, namely,

that he could have done otherwise. The testimony of consciousness (of the subject) here is to the effect that the process in the two classes of cases is identical. In the one class we *know* that he is not free to 'choose,' and yet he thinks he is. So we do know that in this case subjective evidence is worth nothing, and hence, even if this does not prove that he is not free to choose in the other case, it at any rate proves that the subjective feeling that he can choose does not prove that he can. So far we know that *subjective evidence in the one case is false*, and, therefore, may be *justified in believing that it may be false in the other case.*

Now to a consideration of those cases where the subject feels that he is acting under compulsion. What they really show is not evidence in favor of the indeterminist, but rather in favor of the determinist. We know, for instance, that when, in giving a post-hypnotic suggestion, we impress it too forcibly on the mind of the subject, he will, at the time the suggested idea appears in consciousness, feel that there is an alien force trying to gain possession of him, and that if he executes it, he feels that he acted under compulsion. Here the subjective testimony is to the effect that the will was determined, that the subject could *not* have done otherwise, and here *subjective evidence is not only corroborated by objective evidence, but actually by objective proof.* How does it come, then, that in the one class of post-hypnotic experiments subjective evidence is incorrect, and in the other correct? In the first case the suggestion is weaker (or more familiar, etc.), in the second it is stronger (or more uncommon, etc.). That is, if the suggestion is given in such a way that it does not come up with startling force, or if it be one that is not directly contrary to his general inclinations, the subject is not able to see that his decision is 'univocally determined'; when, however, it comes up in a way entirely out of proportion to the end sought, or, contrary to his views or character, he sees that his decision is determined and that there is no ability to choose to do otherwise. In the first case the subject's introspection does not enable him to see the true state of affairs, because the motivating power of the suggestion is only average in power, or because it is common in its nature; in the second case it does enable him to see the connection between the motivating power of this idea and the volitional (or the non-volitional, compulsory) act following, and it is because this one idea comes up in so powerful and unusual a way. It is generally admitted that the testimony of consciousness is unreliable in this matter, and so there is too much of a tendency to look at it as though that meant equally much for both sides of the

argument. So Hyslop ('Elements of Ethics,' p. 214): "If it be illusory [consciousness], argument on either side of the question is perfectly futile, for I have nothing but the testimony of consciousness to the cogency of the argument for necessitarianism." Again (p. 217): "But I do not think that its testimony can be either proved or impeached. It is itself the last resort for such truths as we actually believe, and it proves too much to discredit it and then accept other beliefs which it attests." Now it does seem that, in the light of the above analysis, argument on the one side is not necessarily futile, for the same shows us why the testimony of consciousness in the one case is right, and why it is wrong in the other.

But there is another way in which to get at this question of freedom of choice, and many of the experiments of the writer were conducted with this special purpose in view. Here of course only a few such cases can be considered, but it is his intention to give the whole matter a more nearly thoroughgoing treatment at some later day. Because of the great number of courses of action between which choice can seemingly be made, it is desirable, if possible, to get a case where we can leave open only two such courses, and then see whether it is possible to choose *either* the one or the other. Take the following case in point: A young man is given the suggestion that the first time he meets a certain friend of his, he shall tell him that he is foolish, and, as a reason for saying so, shall tell him, either: (1) that he spends his income too wastefully, or (2) that he devotes too much of his time to a certain young lady. At the first meeting he does tell his friend, after some hesitation, just as was suggested to him, that his friend is foolish. When his friend asked him for the reason why he made such an assertion, he told him that he squandered his money. Now what light does this experiment throw on the question? In the first place, it certainly must be admitted that the suggestion given has determined: (1) his telling his friend that the latter is foolish, (2) his giving a reason for saying so, and (3) that he can choose only one of two given reasons. Thus far, then, we have volitional action under the determination of post-hypnotic suggestion. But when he chooses one of these two reasons we must say that this is 'ordinary' volitional action. Of course everyone is ready to admit that, when he told his friend that he was foolish, it was impossible for him to do otherwise. Now the question is this: When he gave the first of the two reasons suggested, could he have urged the other reason? When asked afterwards why he had thus spoken to his friend he said: "Well, it occurred to me that he is foolish, and so I told him so." "But you know

that he isn't in the habit of spending more money than most of us." "Yes, I know; but I didn't want to offend him by telling my real reason." On being asked for that, he said that he thought that his friend was paying too much attention to a certain young woman. He 'chose' the first reason; could he, constituted as he was, desirous of not offending his friend, and knowing that it would offend him to give the real reason, could he have urged the other reason—could he have 'chosen' the other reason? To answer affirmatively would be to express the most evident contradiction. But before proceeding with this thought, it is instructive to note that the subject called the whole action his own, that there was no hitch or halt in the process when 'ordinary' volitional action followed action determined by suggestion—to all appearances *the process was the same in both cases.*

This particular case shows clearly that only the one reason could be 'chosen' and that under the circumstances existing at the time, 'choice' of the other was entirely out of the question. But it may be objected that in most of the 'ordinary' volitional acts there may be more than two alternatives. Very well. The suggestion here might have been given, as it was in other experiments, simply to the effect that *some* reason be given, without giving a list of those from which a selection was to be made. What ground would there be, then, for believing that whatever reason he gave, was *not* determined (by his character—his self)? Or to take another case: The suggestion is given to call A either a 'fool' or a 'coward.' He calls A a 'fool.' Even if we couldn't tell beforehand what he would call him, there is no reason for believing that his 'choice' was not determined. The fact of the matter is that if we had known the subject well enough, we could have predicted just what he would 'choose' to call A. And so with 'ordinary' actions. Place a man we know very well in a certain position and we can foretell accurately which one of two seemingly possible ways of action he will 'choose,' whereas, with regard to a man we do not know so well, there is only the element of probability in our prediction; and again, with regard to an absolute stranger, of whom we know practically nothing, and who is placed in such a position, we could only guess as to the course he will probably 'choose.' (This, in the light of what has been said, really amounts to a proof by concomitant variations, as was suggested to the writer by Professor Harlow Gale of the University of Minnesota. But it is not the province of this paper to take up this line of argument.)

Simply because we can not in 'ordinary' volitional actions isolate our antecedents and show the causal connection between them and the

volitional acts as consequents, there is no logical reason for disputing such connection. Where the young man above mentioned thought, that under the circumstances then existing, he could have urged the other reason just as well as the one he did give, we of course know that that was out of the question. And so in all cases, just as Schuppe says ('Ethik und Rechtsphilosophie,' S. 96): "Im konkreten Geschehenen gibt es selbstverständlich nur Notwendigkeit, ein 'Gekonnthaben' kann also immer nur den Sinn haben, dass etwas geschehen wäre wenn nur noch die und die Bedingungen hinzugekommen wären." It is not often that consciousness gives us the testimony in regard to 'ordinary' volitional acts, that they were determined. As Fowler says ('The Principles of Morals,' Part II., p. 330): "But it may be replied * * * that the reason is because I am not sufficiently acquainted with all the springs of action and their relative force, and that, when a man comes to reflect on the circumstances of his conduct, he often recognizes his past action as the necessary result of the various forces, internal and external, operating on him at the time." It is instructive to note that when we do so recognize an action of ours to be determined, it is not as a general thing one of the kind we call habitual, but rather one of an unusual nature, most likely one which came about after a severe inner struggle. After what was said in regard to the class of post-hypnotic actions where consciousness gives the testimony that the action was determined we can see why it is that consciousness is able to give that testimony here, and this amounts to *more evidence that the volitional process is the same in both 'ordinary' volitional acts, and acts determined by suggestion.*

One other objection must be considered here. It may be urged that in the case of the young man above mentioned, the suggestion was executed because it was not contrary to his nature (character). Very true. If it had been, he would, in all probability, not have executed it; yet, if in spite of this fact he had executed it, he would probably have said that he had acted under compulsion, as another man did who had been brought to slap a friend of his under the influence of post-hypnotic suggestion. It is this that Schmidkunz refers to ('Psychologie der Suggestion,' S. 276): "Wie die meisten, namentlich aber die misslungenen hypnotischen Suggestionen gerade für die Macht der zu überwindenden Widerstände zeugen, so zeugen die hypnotischen Suggestionen, insofern sie gegen die Selbständigkeit des Subjekts gerichtet sind, auch im siegreichsten Falle von der Existenz des Gegners." The answer to this and similar objections is simply this: The objection is not valid in so far as it is meant to show that

there is self on the one hand, and non-self on the other, either trying to overcome it or actually doing so, and that if the action is performed, it was performed by what was not self. The self at any moment of action is the previous self plus the last impression made upon it—plus the last influence motivating towards action, and the case where an action (of the above class) is performed under the feeling that it was compulsory is no exception. The action of the self may be likened to the action taken by a parliamentary body. Whatever action is taken, whatever the constituency of such body, the action taken is that of the self of that body, whether it took place after a change, either sudden or gradual, in the membership of such body or not. Similarly, in hypnotic experiments, we can change the membership, so to speak, of the self. We simply reduce or modify, at will, the real make-up, and through that, its expression, by means of suggestion. This may be done by inhibiting certain parts of this make-up, and leaving others free to gain their expression, as, for instance, when we suggest to the subject that he may be able to do certain things, but not others. Or, as in post-hypnotic suggestion, we can bring into the self a new factor, which, becoming a part of that self, helps to determine the expression of that self. Where this new factor is not of such a nature as to seek expression in a manner entirely strange to the self as constituted before the ingress of this new factor, it finds its expression, and the testimony of consciousness is to the effect that it was the act of the self. Where this suggestion *is* contrary to the character of what subjective consciousness has recognized as self, the testimony of consciousness will be to the effect that this was non-self, that the self was overpowered, or, in case of refusal to execute it, that there was non-self that tried to overpower self. A better psychological analysis shows how false this view is. Dewey ('Study of Ethics,' p. 129): "There is no factor foreign or alien to the agent's self; it is himself through and through." So also Stephen ('Science of Ethics,' p. 287): "When we say that his conduct is caused by one of those instincts, we do not mean that there is a man *plus* the instinct, but that the whole man, regarded as a unit, including this instinct, acts in a certain way in which a man (if such a man be possible) without that instinct would not act." That volition is the expression of the self, that it is determined by the character of the agent, is now generally admitted. "Which motive is chosen is perfectly fixed and dependent upon the character which cannot choose otherwise than it does." (Alexander, 'Moral Order and Progress,' p. 339.) "* * * but what it means is not that I might arbitrarily, or with no different

self have done otherwise." (Dewey, 'Study of Ethics,' p. 132.) "Zu sich selbst sagen: ich hätte anders handeln können, ist thöricht und sicher falsch." (Riehl, 'Der philosophische Kriticismus,' Band II., II. Teil, S. 271.) "As is its nature (that of a being), so it wills; as it wills, so it acts." (Carus, 'Monist,' Vol. III., p. 87.) "Ein Mensch handelt in einem jeden Augenblick seiner derzeitigen Beschaffenheit gemäss." (Gizyčki, 'Moralphilosophie,' S. 219.)

After having attempted to show that the volitional act is determined, with the self as the main determining factor, the next step would be to take up the question as to whether that self itself is determined, but that is not the purpose of this paper. And so, also, the question of responsibility cannot be taken up here any more than to quote from several writers. Stephen ('Science of Ethics,' p. 285) says: "I do not diminish a man's responsibility when I 'cause' him to act, but only when I cause him to 'act involuntarily.'" And Dorner ('Das menschliche Handeln,' S. 129): "Man behauptet vielfach, dass alle Verantwortlichkeit mit Leugnung der Wahlfreiheit aufhöre. Allein das Ich, welches thätig ist, rechnet sich die Handlung einfach deshalb zu, weil es bewusst thätig ist, also sich als handelnd weiss. Ob diese Handlung aus Wahlfreiheit geschehen ist, kommt hierbei nicht in Betracht. Das Ich ist thätig, und weiss sich als thätig: die Verantwortlichkeit ergibt sich aus dem Bewusstsein der Aufgabe, nicht der Wahlfreiheit. Weil ich etwas vollführen soll, bin ich verantwortlich dafür. Freilich hört meine Verantwortlichkeit auf, wenn mich äussere Umstände, die ich nicht beseitigen kann, an der Erfüllung meiner Aufgabe hindern."

In conclusion, where most of the representatives of modern philosophy are agreed that the volitional act is determined, it has been the attempt of the writer to bring forth some evidence that will strengthen the position of the determinist still more. He has thus attempted to show that there seems to be no valid reason for believing that there is any difference between the volitional process in 'ordinary' volitional acts, and acts performed under post-hypnotic suggestion; that to the subjective consciousness there is ordinarily no such difference; that when there is such difference attested to by consciousness it can satisfactorily be accounted for by the explanation as to when the testimony of consciousness is apt to be right, and when wrong; and that even though all that has been said does not prove the absence of such difference, it must be assumed to do so in the absence of disproof.

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PSYCHOLOGICAL LITERATURE.

The Play of Man. KARL GROOS, Professor of Philosophy in the University of Basel. Translated with the author's coöperation by ELIZABETH L. BALDWIN, with a preface by J. MARK BALDWIN. D. Appleton & Co. 1901. Pp. v + 406.

This sequel to the author's 'Play of Animals,' which was also translated by Miss Baldwin, is even richer in fact, discussion, and theory than its predecessor. The same practice theory of play is adopted, and the general plan of treatment is similar. But corrections and supplementations of the earlier pioneer work, that have occurred to the author on further reflection, or that have been suggested by critics, appear at many points. Notable among these are a more careful explanation, in the introduction, of the 'instincts' or 'impulses' upon which play is based, and a more mature theory of imitation. The theoretical discussions also are considerably developed.

In the introduction the author tells us that "among higher animals certain instincts are present which produce activity that is without serious intent, and so give rise to the various phenomena which we include in the word 'play,'" and that the same is true of man. But, in order for this statement to hold, the word instinct must be used in an extended meaning. Usually it means 'an inherited association between stimuli and particular bodily reactions.' But the imitative impulse is the basis of many plays, and yet it does not lead to particular reactions, and does lead to reactions that are intellectual rather than bodily. Moreover many actions, both physical and intellectual, seem to be due to a certain primal 'need for activity,' not for particular activity, but for activity in general. To use the word instinct for tendencies to activity so heterogeneous and unspecified, would be, in view of the technical meaning of the term, to run the risk of endless confusion. On the whole then Professor Groos is inclined to designate the basis of play as 'natural or inherited impulse,' though he is aware that impulse has an exclusively physical connotation in its more exact usage, and does not deny himself the use of instinct in contexts where no confusion would arise.

In the introduction the author also lays down the two chief criteria of play, the biological criterion, that 'it shall deal not with the serious exercise of the special instinct, but with practice preparatory to it,'

and the psychological criterion, that the act shall be performed 'solely because of the pleasure it affords.'

The main body of the book, covering some 350 pages, is primarily analytical and descriptive, while the conclusion of 46 pages deals with theories of play, physiological, biological, psychological, etc. Omitting these theories for the present, a hasty glance will give some idea of the topics discussed in the analytic portion.

Play being based upon 'inherited impulse,' a classification of impulses is adopted as a basis for the classification of plays, not because the resulting arrangement is unexceptionable, but because it 'may serve to open at once to the reader the inmost core of the subject,' and at the same time be sufficiently comprehensive of the main types of play. Plays are accordingly divided into two main groups, those that train the individual to manage his own psycho-physical organism, and those by means of which he gains control over actions of his 'directly concerned with his relations to others.' For plays of the first type the somewhat unfortunate and puzzling designation 'playful experimentation' (in the original, *spielende Experimenten*) is adopted. This does not mean that such plays are entered into for the conscious purpose of gaining knowledge or of discovering the best means to chosen ends, as Professor Groos's readers, scientists for the most part, might naturally suppose; for such activity would not be playful. Nor does the term connote the blind experimentation by trial and error, characteristic of the learning of animals; for that, too, is serious. Playful experimentation is merely an exercise of impulse that in fact leads to the acquisition of skill, though it is guiltless of any such intent, or indeed of any ulterior intent. One does not see why the editor's happy suggestion of 'autonomic' impulse was not here substituted, especially as 'socionomic' impulses, also his suggestion, is used in the translation to designate the second order of impulses above referred to.

The playful exercise of autonomic impulse, to use that convenient term, falls into three main groups. Sensations of the various senses, of all kinds and in all combinations, may be sought for the enjoyment they give; noteworthy here being delight in the production of sounds, the playful basis of speech and all it implies, and delight in the perception of form, the basis of drawing, etc. Many plays consist in the exercises of the motor apparatus, whether the bodily organs be moved, or foreign bodies be moved through their agency; here belong destructive and constructive plays, playful feats of endurance, throwing and catching plays, etc. Finally, the higher psychic powers may

be playfully exercised; as in memory, imagination, and reasoning plays; or even pain, in the most general sense of the word, may be playfully sought, as in the worrying of a sensitive tooth; and many games essentially consist in the exercise of will power, as where winking or laughter has to be suppressed.

Plays of the second or socionomic order, on the other hand, fall into four groups, fighting, love, imitation, and social plays. Among the first are included playful rivalry, teasing, hunting, witnessing fights, and the tragic. Under the second head we find discussions of courtship and sex in the comic. The third group contains discussions of dramatic, plastic, and inner imitation, the last being an extremely interesting account of Clifford's ejecting process in its playful exercise. Here imitation itself is also discussed at some length. Social play is considered rather from the standpoint of theory, and this section serves as an introduction to the general theoretic discussion that immediately follows. The classification serves well the author's dual purpose, being comprehensive and giving the reader an insight into the heart of the subject.

Under each of the subheads above suggested examples of the plays both of children and of adults are briefly described and carefully analyzed. It would be interesting to follow the author into detail, but that is of course impossible here. Moreover Professor Groos's book is much more than a mere descriptive catalogue of human plays. To be sure, in the interest of thoroughness, it is compelled to be that in part, and thus continuous reading becomes just a little tedious over some stretches. But, on the other hand, the value of the volume as a book of reference is greatly increased by the author's thorough treatment of his extensive field. And in addition much that is interesting and stimulating appears at frequent intervals. For under Professor Groos's scholarly and fruitful treatment discussions of various types of play are made to throw light on many obscure problems, in psychology, biology, sociology, and æsthetics. Indeed few pages intervene, for the most part, between illuminating discussions of important problems. A few examples will give some idea of this aspect of the book.

After discussing sound-play among children and adults, and pointing out that sound as such, but especially exciting sound, is enjoyed and even craved, the author discusses the question, 'Whence is derived the strong emotional effect (1) of rhythm and (2) of melody?' Darwin's theory that this pleasure arises as an effect of sexual selection affords, to Professor Groos's mind, a partial but not a radical explanation. Song plays a part in the courtship of birds, but their kinship to us is

remote. Mammals generally rely little on courtship, monkeys hardly at all, and most of the latter, moreover, make no use of sounds in that connection. Besides, among primitive races music does not seem to be very closely related to sexuality.

The relation of rhythm to the emotions is intrinsic rather than adventitious, thinks Professor Groos. The rhythm of sound is in deep accord with the rhythm of our organic processes, with heartbeat, breathing, the step, etc., and with the pulse of attention itself. And, probably because of this accord, rhythm easily induces a state of semi-trance which, as Nietzsche, Souriau and others have shown, is the precondition of æsthetic delight. But the trance state is merely the precondition; the suggestibility incident thereto is the portal through which our æsthetic pleasures enter. Rhythm entrances us; the other elements of music suggest to us pleasant dreams.

And among these other elements the most potent is melody, whose power can best be explained by saying 'that it makes the impression of a dancing voice.' For, in the first place, melody is the quintessence of movement, movement disembodied, rid of the grossness of substantiality, present to consciousness in its naked purity, and stirring us as living movement alone can. And, in the second place, melody, in its enchantment of onflowing tones, is a voice, speaking a language of its own, addressed to the emotions, and capable of arousing them, from the tenderest to the boldest and most massive, in all combinations of accord and discord.

In short, sound, and especially rhythm and melody, being intrinsically delightful, are sought and played with by child and adult, and thus out of productive sound-play music has developed. Courtship has merely influenced the growth of music, and that chiefly in its later stages. Professor Groos returns often to Darwin's theory of the relation of art to sexual selection, and especially in discussing love play in art he considers it together with Grant Allen's closely allied views and concludes that play is the principal source of art. His theory certainly explains well the essential sportiveness of art, and throws light on a certain irresponsible sportiveness characteristic of artists, and besides is fortified by facts, discussions, and citations of authorities, that cannot be repeated here.

Though familiar to many from its mention in 'The Play of Animals' and elsewhere, the author's theory of the origination of attention in the animal instinct of lying in wait deserves mention. Warned of the proximity of prey or enemy, the animal restrains his whole body to stillness to avoid all betraying sounds, holds his muscles tense, and

braces his entire organism for appropriate action at the proper instant. This preparedness and expectancy becomes, when constantly renewed, the concentration on an object that develops into theoretic attention.

In discussing dramatic imitation Professor Groos replies courteously to Hall and Allin's remark, in their article on tickling, etc., that his theory of practice and preparation is 'obviously wrong' in the case of the playful imitation of animals by children. Imitation in general, he insists, is of great biological importance as practice, and its extension to animal actions is not remarkable. Besides, a thorough knowledge of animals is essential to primitive man, and playful imitation yields knowledge the most thorough and intimate. As against his critics' theory, advanced in partial explanation, that the animal-like behavior of children is a recapitulatory development of animal instincts that, growing to a maximum, will be controlled and subdued by higher powers duly unfolded, Professor Groos objects that the child imitates animals only with effort, 'and this at a time when it has already progressed very far in the acquirement of human capabilities' (p. 303). Professor Groos's defence is strong and his objections weighty. But, while Hall and Allin's theory cannot explain the wide-spread imitation of animals, for the reasons mentioned, because the imitation is often conscious, and because many of the animal species imitated do not fall within man's ancestry, yet it explains well much animal-like behavior among children, especially in quasi-pathological cases.

Of the many other important discussions in the section dealing with imitative plays we have space to mention only three: the account of the relation of imitation to instinct; the brief discussion, satisfying as far as it goes, of the origin of language; and the description of inner imitation. To prevent misunderstanding it should be said that imitation in the author's usage is not synonymous with Tarde's broad meaning, nor with Baldwin's 'circular reaction,' but rather with Lloyd Morgan's 'repetition of the acts of one individual by another.' This usage is adopted as a matter of convenience, not in disapproval of the broader connotations.

Premising that in man imitation is not so much a temporary substitute for instinct, according to the thought developed in Baldwin's theory of organic selection, as a type of action supplementary of the instinctive that tends to 'relegate instinct to the category of things rudimentary,' Professor Groos proceeds to raise the question whether we might not be justified in calling the imitative impulse itself an instinct. The difficulty in the way of an affirmative answer is that

'in imitation we have a thousand varying reactions,' in place of one clearly defined reaction, and it is therefore necessary to proceed with caution.

But in imitation two points are reasonably clear, first the existence of certain more or less generalized types of reaction as hereditary possessions, and secondly, in conscious, or what is sometimes called voluntary action, the tendency of the idea of an action to produce the action itself. Song birds may learn to sing, little girls to 'nurse,' boys to fight, even when no models offer themselves to suggest ideas of these actions; there are general tendencies to action in these directions, and in 'playful experimentation' somewhat satisfactory performances may be learned. But when good models are presented, both the performance of the action and its relatively superior quality are insured. Imitation seems therefore to be based on more or less rudimentary or generalized instincts, that impel to types of reaction rather than to specific reactions, and to find its supplementary factor in dynamogenic ideas suggested by the observed conduct of others. The model without the instinctive basis has not sufficient force—boys seldom 'nurse'; the rudimentary instinct without a model may develop into action, but the action will be imperfect, and, besides, will not be imitative. Thus, in the higher animals and man, imitation, or more generally tradition and social heredity, put the finishing touches on generalized instincts, and make possible a nicety and flexibility of adjustment unattainable where instincts are rigid. Professor Groos also points out that curiosity, 'How does he do it?' the fighting instinct, 'I can, too,' and the pleasures of recognition and illusion, make powerfully for imitation. And other varying groups of instinctive aids are present in different cases of imitation.

So far imitation is closely connected with instinct, but is not itself an instinct. But Professor Groos notes the keenness of the pleasure imitation gives, the strenuousness of the impulse to imitate, and the seriousness of the disappointment in case of failure, and inclines cautiously to the opinion that these may be 'direct results of selection and the developmental factors connected with it.' If so, imitation is a 'phenomenon at least similar to instinct.' However, conclusions here are doubtful, and the author is too cautious to commit himself.

The author gives his theory of the kinds of sound out of which language develops in a paragraph. It is not out of sounds imitated from those heard in the environment, nor out of interjectional sounds, nor out of both that the whole of language develops. For many sounds, *e. g.*, mamma, papa, adda, arise from neither source, being rather

the results of 'playful experimentation.' Language grows up then as a result of the imitation of all three, of natural, of interjectional, and of experimental sounds. It is to be regretted that Professor Groos has not addressed himself to explaining how sounds that in fact convey meaning come to be uttered in order to convey meaning. His familiarity with the facts in the field of animal psychology would give great weight to his conclusions.

Much has been made of late, especially in Germany, of inward sympathy as a most important factor in æsthetic enjoyment; some, for instance Lipps, going so far as to hold that æsthetic enjoyment *is* agreeable inward sympathy. Professor Groos carefully analyzes the complex state of inward sympathy or inner imitation, and describes at some length its relation to æsthetic enjoyment. In inner imitation we conceive of the inner experience of others, even attributing psychic states to lifeless objects; we participate in the movements of persons and things and conceive of tensions and stresses in bodies at rest; and we transfer in thought our resulting emotions to whatever arouses them, speaking of 'the solemnity of the sublime, the gaity of beauty, etc.' As Lipps says of the Doric column, "The vigorous curves and spring of such a pillar afford me joy by reminding me of those qualities in myself and of the pleasure I derive from seeing them in another. I sympathize with the column's manner of holding itself and attribute to it qualities of life because I recognize in it proportions and other relations agreeable to me." All this Professor Groos admits, for he too maintains that inner imitation forms a large part of æsthetic enjoyment. But he supplements Dr. Lipps's statement by important additions, the first three enriching the concept of inward sympathy with further specifications, the fourth setting forth that play is a neglected factor, which, joined to inner imitation, rounds out æsthetic enjoyment. First, the beautiful object does not, as a starting-point of association, merely call up in succession qualities, etc., formerly experienced in oneself. The situation is not one where states are aroused in succession by association, but one where all the elements are co-present and intimately fused into unity. Secondly, the sympathetic inner state movement and mood do not consist of mere ideas of past experiences. They are present live states; in admiring the Doric column one actually braces oneself as if for support, etc. But thirdly, the sympathetic movements, stresses and strains are symbolic, not overt acts, as Lee and Anstruther-Thomson apparently believe. And fourthly, inner sympathy may be aroused, as when thunder is heard as an angry voice, without æsthetic enjoyment. Only when the state

is pleasant, and is lingered over and *played* with is there æsthetic enjoyment.

The theoretic discussion that closes the book is in part, though by no means wholly, a summary of conclusions already reached, considered from six points of view, the physiological, the biological, the psychological, the æsthetic, the sociological, and the pedagogical. As much as is here possible has been said of the author's biological and æsthetic theories, and the length this review has already reached forbids any mention of his sociological and pedagogical views, the latter being besides least fully worked out. But a few words must be added on the physiological and psychological theories of play.

Play in childhood and youth finds its physiological explanation largely, according to Professor Groos, in the presence of surplus energy, as Spencer rightly holds; but the plays of adults, or at least many of them, must depend on the rival recreative theory. To be sure the two theories are often mutually assistant, weariness in one direction leading to the desire for recreation, while surplus energy in another direction calls for playful exercise. But it not infrequently happens that recreation is found in the exercise of functions whose energy is merely normal or even subnormal, and sometimes even in just a variation in the exercise of a tired function, as when an investigator turns from one aspect of his problem to another.

Moreover there is one familiar fact that neither theory successfully explains, the fact of the continuation of play to the point of exhaustion, and, if possible, beyond. This the author explains as a result, partly of Baldwin's circular reaction, and partly of the state of semi-trance induced by many plays. A critical comparison of this physiological theory with Marshall's pleasure-pain theory would be interesting at this point did space limitations permit.

The two psychological criteria of play that Professor Groos accepts are, 'its pleasurableness, and the actual severence from life's serious aims.' The consciousness that the play is a sham counterpart of a serious activity, which Wundt defends, the author rejects as a universal criterion. Objectively play is such a counterpart, but subjectively it is often too absorbing to be so interpreted. The little girl engrossed in her doll, the boy absorbed in his toy soldiers, have no such consciousness. Of course the severance of play from life's serious aims, or, a little more exactly, from any ulterior aim, is what differences it from work. And if it be objected that the distinction is often impossible of sharp application, immediate and ulterior aims differing in degree only, Professor Groos is ready with the answer that play and

work are not in fact sharply different, since, on the contrary, one often shades imperceptibly into the other.

But a more subtle and difficult psychological distinction is that between plays and pleasures, and this unfortunately the author has not attempted to draw. The closeness of the two concepts is evidenced by the striking likeness of Marshall's pleasure-pain theory and the author's physiological theory of play. Indeed it may be suggested that 'The Enjoyment of Man' would probably have been a more accurate title than 'The Play of Man.' For witnessing a theatrical performance, admiring a Doric column, and in general what the author calls receptive plays, are more naturally called enjoyments, or, to bring out the whole difficulty at once, pleasures, than plays. But while Professor Groos does not expressly face the difficulty, he offers material for its solution in many passages, and it may be for that reason that he does not feel the need for explicit discussion. He repeatedly remarks that the pleasure in being a cause, *i. e.*, in conscious production, is present in practically all plays, and in discussing receptive plays he emphasizes the fact that inner imitation, with its keen sense of activity, is an essential factor. Again, the remark frequently recurs, that the mere presence in consciousness of a pleasure does not make the state playful; it is essential that the pleasure should be actively sought and lingered over. And finally, play is always an impulse in actual exercise. In short, all plays are pleasures of activity, and, while it is not true conversely that all pleasant activities are plays, it is true that pleasant activities become plays when performed for their own sake. Evidently an understanding of play will throw much light on the difficult questions of the nature of pleasure, and of its place and function in life.

A good translation, which this one is, of so valuable a work into English is a subject for congratulation. But it is unfortunate that the proofreading was not more careful; see, for instance, the last paragraph ending on page 381. It is unfortunate too that a book so rich in fact and theory, whose arrangement frequently compels the same problems to be discussed from different points of view at different places—that what is in short essentially a book of reference, should not have a subject index; the index of authors is not an adequate substitute. Another addition that would greatly improve a second edition would be full footnote references by the translator or editor to authorities on play writing in English.

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Pascal. Ad. Hatzfeld. Les Grands Philosophes Series. Paris, Félix Alcan. 1901. Pp. 291.

M. Adolphe Hatzfeld, who died the year before this work on Pascal came from the press, was trained in that famous nursery of scholars the *École normale supérieure*, and later was professor in the Lycée of Louis-le-Grand. The volume is one of the series: *Les Grands Philosophes.* The chapters (Part Third) on the scientific writings of Pascal are written by Lieutenant Perrier, member of the French Geodetic Survey; the rest of the book is from the hand of M. Hatzfeld. The work is a comparatively full and skillful statement of the fundamental facts in Pascal's spiritual development, admirably reviewing his services to science, philosophy, and religion. There are few facts of an external kind to tell concerning Pascal's career. His life was little connected with affairs, and M. Hatzfeld makes this plain in the title of the biographical chapter, *biographie psychologique.* The outward life is noticed only in so far as it serves to explain the man's thoughts or beliefs. It was important for Blaise Pascal that when he was eight years old (b. 1623, his mother died 3 years later) his father, Étienne, resigned the Presidency of the Court of Aides, at Clermont, and moved to Paris, where he had superior opportunities to advance the education of his only son. The father was himself a considerable mathematician and well trained in science and literature. The great contemporary mathematicians Fermat, Mersennes, Roberval, and Le Pailleur were frequent visitors at his house, where Descartes also visited at different times. From the date of his resignation, his sole passion appears to have been the education of his son. Blaise early exhibited prodigious talent for mathematics, but was kept from their study and instead was carefully instructed in the teachings of Christianity, the precept being strengthened by the father's noble example. His education was carried on almost exclusively under his father's direction, who did not suspect that the extraordinary diligence of the precocious boy added to the gravity of his physical weakness. These facts of the father's guidance in mathematics and religion, the tense application of the nervous, delicate child, and his late renunciation of science for a cloister-life, were of primary significance for Pascal's career. His chief importance in the history of thought lies in the domains of mathematics and religion, and he appears to have abandoned the former for the latter, partly, at least, for reasons to be sought in his pathological condition. M. Hatzfeld, who writes entirely from the standpoint of the *vie de Pascal* written by Mme. Périer (*née* Gilberte Pascal) and Catholic orthodoxy, sees nothing neuropathic in

Pascal's condition. Even the famous *amulette* is regarded by M. Hatzfeld as only a triumphal cry of the faithful, a staccato note of spiritual joy! (p. 53). The exaggerated asceticism (*e. g.*, his wearing a belt of spikes), his morbid antipathy to marriage exhibited in his advice to his niece, the awful abyss that yawned before him from time to time and of whose unreality he found it hard to convince himself, his belief in the miracle of the Holy Thorn, his plunging one year into the gaities of social life (in 1652 he is said to have been enamoured of a lovely *femme savante*, then known as the Sappho of Auvergne) and another year withdrawing into the solitary life of an anchorite—these seem to M. Hatzfeld to be normal marks of an exalted religious devotee, while to most observers they no doubt suggest a neurotic taint in Pascal's genius. His last years, the years of the *Pensées*, are the legitimate product of his early education, an education devoutly religious on the one hand and scientific on the other—combined with a nervous, delicate organization.

Cousin, who through his rediscovery of the Pascal MSS. in the *Bibliothèque nationale* (then *royale*) and his famous report on the same to the Academy has done more than any one else in the century to revive interest in the great Port Royalist, considered Pascal the declared enemy of all philosophy, because he was a complete and avowed sceptic. He says Pascal took refuge in religion as our last resource in the impotency of reason. Against this charge of scepticism and the rejection of philosophy, M. Hatzfeld replies that Pascal does not reject philosophy and science, but merely delimits the domain of their puissance and certitude. This, to be sure, is a survival of the old standpoint of mediæval theology—the standpoint of a twofold truth. Pascal's mind was fashioned by three main influences. Augustine and the Middle Age philosophy, the scepticism of Montaigne, and the discipline of mathematics, which last furnished to the seventeenth century its ideals of philosophy. In the *Pensées* we find everywhere the spirit of Montaigne combined with the religious philosophy of Augustine, and the form of statement is fashioned after the models of geometry. Pascal was in the legitimate sense of the word a sceptic. He discovered in the nature of reason itself, as an inadequate instrument for the acquisition of the highest truth, the motive for the subordination of reason to faith. He made a metaphysic of scepticism subserve religion and, as a true Roman Catholic, regarded his philosophy as *ancilla theologiæ*. The contrarieties or antinomies in the reason itself, its feeble inadequacy on the one hand and its majesty on the other, are best illustrated by an extract from his conversation with

M. Saci in 1654 (preserved and reported by Fontaine) regarding Epictetus and Montaigne, the two authors whom Pascal most read. "I cannot dissemble that in reading Montaigne, and comparing him with Epictetus, I find in them the two greatest defenders of the most celebrated sects of the world, who profess to follow reason rather than revelation. We must follow one or the other. Either there is a God and a Sovereign Good, or this is uncertain, and all is uncertain—whether there is any true good or not. * * * The error in both is in not seeing that the present state of man differs from that in which he was created. The one, observing only the traces of his primitive grandeur and ignoring his corruption, has treated human nature as if it were whole, without any need of a Redeemer—this leads to the height of pride; the other, sensible of man's present misery and ignorant of his original dignity, treats human nature as necessarily weak and irreparable, and thus, in despair of attaining any true good, plunges it into a depth of baseness" (Tulloch's *Pascal*, p. 185). This contrariety in the nature of man is the central notion in Pascal's philosophy. Either of these two elements in man, when taken alone, gives a false and fragmentary presentation of his nature. The philosophy of Christianity explains the union of these two elements of human nature by the doctrine of the Fall and the doctrine of Redemption. The fact that Christianity in this way harmonizes with man's moral psychology is, in Pascal's view, the strongest proof of its truth (*Pensées*, Chap. IX.). The complete truth is discovered to us by revelation and is appropriated by an act of faith, but it is not discoverable by any process of reason. Pascal is, therefore, an absolute Pyrrhonist in philosophy, but precisely because of this Pyrrhonism in philosophy he is a profound and ardent believer in a higher truth. He is at once sceptic and believer—a sceptic as to the competency of reason to discover adequate truth and a believer in the competency of the heart and faith, as instruments of revelation. He admits the sufficiency and authority of reason in the domain of human science and asserts its futility in all that transcends this domain. Scepticism in philosophy is for him the logical antecedent of belief in revealed knowledge. *La foi est dans le cœur* (*Pensées*, X., xi.) and is higher than reasoned truth in the sense of supplementing reason in a domain into which reason's processes cannot penetrate. Pascal and Descartes agree in saying '*la croyance a besoin de la volonté*' (p. 260), but in the philosophy of Descartes it is the reason that moves the will, while in Pascal it is the heart or feeling that determines the will to assent or dissent. Pascal transcends the Pyrrhonism of Mon-

taigne by admitting the adequacy of spiritual instinct as a source of ultimate knowledge. The contrarieties in the nature of man indicated in the conversation with M. Saci furnish the keynote of Pascal's thought, of his scepticism and of his faith.

It is Montaigne's world of 'abysmal dilemmas' that has impressed itself on Pascal. "There is nothing more extraordinary in the nature of man than the contrarieties which are discovered in it on almost every subject. * * * We have a powerlessness for determining truth, which no dogmatism can overcome; we have a vague notion of truth, which no Pyrrhonism can destroy. We wish for truth and find within only uncertainty. We seek for happiness and find only misery. We cannot but wish for truth and happiness; yet we are incapable of attaining either" (*Pensées*, V.). This condition of helplessness united with aspiration towards a higher state represents man's condition since the Fall. In this condition all good and all truth are due to divine inspiration and revelation. Pascal's creed is a composite of logic and feeling, whose product is rational scepticism and spiritual faith. His creed is the creed of the mystic; his belief is a thing of the heart. Intellectually he is a true disciple of his master Montaigne, whose motto suited no sceptic better than Pascal: *Que sais-je?* Pascal simply wills to believe and prepares his heart for the light of grace in the spirit not of Augustine, Calvin and Jansen, but in the spirit of the semi-Pelagians (pp. 109, 275). The contribution of Pascal to philosophy consists mainly in his animating the old apologies for the Christian religion with what Voltaire called an '*éloquence ardente et impérieuse*' (p. 271). Further, after the manner of a physicist, he seeks some law to explain observed facts in human nature, especially the above-mentioned contrarieties of *grandeur et bassesse*, and he finds that Christianity by its doctrine of the Fall furnishes the only intelligible explanation of these opposing phenomena and the doctrine of Redemption their only remedy. The significance of his philosophy, as above noted, is to be sought chiefly in the domain of religion.

As to the famous 'wager' argument for the existence of God, which most moralists handle with an uncanny feeling, it is not an invention of Pascal, but was commonly used by the Port Royalists and is found even in Plato (*Phaedo*, 107C), as M. Hatzfeld points out. Further, Massillon, La Bruyère, and Leibniz regard the argument as logically valid and morally sound. Voltaire, on the other hand, calls it "un peu indécent et puéril; cette idée de jeu, de perte et de gain, ne convient point à la gravité du sujet" (Vol. XXVI., p. 237). Belief in God on this ground is evidently divorced from the claims of

truth and is rested entirely on claims of interest. Again, stating the situation thus: God either is or is not. If you stake your belief in the existence of God and win, you gain infinity and lose nothing; if, on the contrary, you place your wager on the side of God's non-existence, you win nothing and lose infinity. The criticism of Voltaire appears to be just. Further, the claims of interest here may be valid grounds for conduct, but they cannot be converted into valid grounds for belief. Claims of expediency and interest may require us to look up and down a railroad track before crossing, but they constitute no ground for believing a train is coming—in fact we may believe it actually unlikely, on the calculation of probabilities, that a train is coming. It is, further, not necessary, as Pascal assumes it to be, either to assert or deny the existence of that which may be regarded as indemonstrable or doubtful (Voltaire, *ibid.*).

Pascal was an ardent religionist from the time of his so-called second conversion (the accident of 1654, at the bridge of Neuilly). In that year he completely retired from the world, profoundly impressed with the position of man suspended here 'between the too abysses of infinity and nothingness, and equally remote from both,' with the triviality of scientific research, and with the supreme necessity of spiritual light and grace. To this end he accepted the ceremonial means of the Church and subscribed to its dogmas. Logic and mathematics were of no avail; they only tie us to the small world of sense—a world that grew hateful in his eyes, as he withdrew more and more into 'the renunciant life.' He practised a rigid asceticism worthy of the most stringent anchorite; marriage, the pursuit of secular truth, even the most innocent diversions, became cursed with a carnal taint. Relief and happiness were to be sought for in the work of grace, the application of holy water, and the purchase of masses, of which Pascal says: "We must conform our minds by following those who have observed the saving rites of the Church, *en prenant de l'eau bénite, en faisant dire des messes*, etc.; *naturellement même cela vous fera croire et vous abêtira* (*Pensées*, ed. Havet, 5th ed., Vol. I., p. 152). On this Leslie Stephen comments: "Drug yourself with holy water or be a brute beast! We reply, as the old Duchess of Marlborough replied to her doctor's statement that she must be blistered or die: 'I won't be blistered and I won't die.' We won't be drugged and we won't be brute beasts." (*Studies of a Biographer*, Vol. II., p. 282.)

The original character of the posthumously published *Pensées*, which were meant to be a systematic apology for Christianity, but which

Pascal, owing to feeble health, left a mass of disordered jottings, is best exhibited in the critical edition of Michaut (Fribourg, Suisse, 1896). The most judicial reconstruction of this fragmentary mass has been furnished by M. Faugère (in the new edition only the *Lettres Provinciales* have so far appeared, 1886–95), and M. Havet (5th ed., 1897).

Pascal's most notable literary achievement was, no doubt, the *Lettres à un Provincial.* In this series of 18 letters (from January, 1656, to March, 1657, put on the *Index expurgatorius* Sept. 6, 1657) in defence of M. Arnauld against the Sorbonne and the Jesuits, Pascal proved himself not only the greatest controversialist of the 17th century, but incidentally he became thereby the creator of modern French prose. Of these letters to an imaginary friend Voltaire says: "The best comedies of Molière have not more wit than the earlier letters, nor has Bossuet anything more sublime than the later ones (*Siècle de Louis XIV.*, Ch. xxxvii.). The letters were, in their apologetic function, directed to the defence of M. Arnauld and the doctrines of Jansenism; in their offensive character, they were aimed at the doctrine of probabilism in the ethics of the Jesuits. The letters worked more injury to that order than any attack made against it from its foundation by Loyola. The letters were read by everybody and went through numerous editions even in the life of Pascal. They are full of eloquence, of convincing fervor, of stinging satire galvanic in its effect on Pascal's contemporaries, and withal they are a perfect example of literary art. They filled the world with the fame of Port Royal and its cause, and they stimulated into being a great mass of replies, frail, impotent, lasting for a day. M. Hatzfeld points out the fact that Pascal was opposed to the real Jansen, the Dutch Calvin of the *Augustinus;* he is indeed the defender of certain Jansenists but not of Jansenism (p. 206). On the contrary, he was in his position regarding the subject of grace and free will (the Jansenists being determinists) a semi-Pelagian and no true disciple of Jansen. The feud between Jesuit and Jansen, immortalized by Pascal, was a feud in the main touching the obsolescent questions of sufficient, proximate, and efficacious grace and the use of casuistry. M. Hatzfeld reviews the controversy in its essential historical and logical features, a somewhat unsympathetic review from the Pascalian standpoint. Although M. Hatzfeld characterizes the style of Pascal's letters as filled '*avec une ironie charmante*,' yet the argumentation, he says, is unsound. "*Pascal retombe dans le même sophisme, lorsqu'il invoque pour égayer les lecteurs*" (p. 204). There is not space to say more here

about M. Hatzfeld's account of this great polemic, a thing now of interest chiefly to the historian of theology.

M. Perrier in his chapters on the scientific work of Pascal has furnished us with a history of a much neglected side of Pascal's life. His genius was fundamentally scientific, and had it not been for his associations with the men of Port Royal his achievements in this field would doubtless have entitled him to rank amongst the foremost discoverers in mathematics and the philosophy of nature. M. Perrier concedes that Pascal is in no sense to be called the creator of modern experimental method (p. 141), although the famous experiment of Puy de Dôme (1648) was perhaps the most notable of the early experiments in physics and effectually relegated to the limbo of myth nature's *horror vacui*. His unassisted solution of the twenty-third proposition of Book I. of Euclid's Elements at 12 years of age, his works on Conic Sections at 17 (published 1640), his arithmetical machine (the predecessor of all arithmometers) at 19, his creation of analytical geometry and the theory of probabilities (1654), and his final researches on the cycloid are familiar episodes in the scientific career of Pascal and form the chief subjects of M. Perrier's commentary. Pascal was a mathematical genius with a strong philosophical bent, who, by the accident of a feeble physique and a mental constitution made morbidly religious by his neuropathic condition, abandoned his early scientific pursuits, became one of the most notable apologetes of Christianity, the greatest controversialist of his age, and wrote a standard for the fixation of French prose.

The volume of M. Hatzfeld, like many French books during the last decade, has been sent out into the world a cripple—it has no index.

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A Further Record of Observations of Certain Trance Phenomena. James Hervey Hyslop. Proc. Soc. Psych. Res., Pt. XLI., October, 1901, pp. 1 to 649.

In this report of 649 pages the author presents the results of his own investigations into the case of Mrs. Piper, together with an exhaustive analysis of the data and a discussion of their theoretical bearing. It may be well to state at once that he decides in favor of the spiritistic interpretation of the phenomena. Approximately the first half of the work is devoted to a discussion of the rival theories of telepathy and spiritism, this being preceded by a systematized abstract

of the records. The second half is made up of several appendices which contain the detailed records of the twelve sittings held by Professor Hyslop himself, together with those of the five sittings held by Dr. Hodgson for the former during his absence in New York. It is much to the author's credit that he urges upon the reader the necessity of making a careful study of these unabridged records before forming his opinions. Certain it is that many of the passages are far less convincing when read in their original context than when transplanted into Dr. Hyslop's zealous defense of spiritism. In the appendices are further recorded the results of some experiments in which the author endeavored to parallel certain phases of the Piper phenomena, by means of telegraphic messages and by talking through a speaking tube. These cannot be said to throw much light upon the subject.

As in all previous reports of the Piper case, facts are offered which seem, *prima facie*, to be conclusive evidence of some supernormal faculty or faculties on the part of the 'medium.' The present work differs in one respect from the earlier ones, in that here the 'communications' were all recorded by the medium's hand in writing ('Rector' control) instead of being uttered by her orally ('Phinuit' control) and recorded by one of the sitters. Thus one possible source of error is eliminated.

Of conscious fraud as an explanation of the phenomena in this case, Professor Hyslop remarks that he regards it "as having been excluded from view as much as ten years ago, and no one except those who have resolutely remained ignorant of the Society's work in general * * * would compromise his intelligence with that accusation without giving specific proofs of it." We may agree with the author in rejecting the fraud hypothesis as a probable one, but it is not likely that most psychologists will make the admission that it has been altogether 'excluded from view.'

But there is another possible explanation of many of these phenomena which would not carry us into the realm of the supernormal. This is that suggestions and indications are unconsciously given by the subject to the medium, the latter being in a hyperæsthetic and highly suggestible condition. 'Muscle reading' was rendered impossible in Professor Hyslop's experiments by the avoidance of physical contact between himself and the medium. Of verbal suggestion he says: "There are a few isolated instances, to which I have called attention in my notes and remarks as occasion required, in which suggestion is a conceivable explanation. But these are too few to allow them any weight in the whole, which the reader can easily see is unaffected by

such suspicions. * * * They are too infrequent to justify the waste of time and space in their examination" (p. 247).

But the author has certainly given far too little weight to such suggestions. Let us note a few of the 'isolated instances.'

"(Have you seen mother?) She is here with me. She is all right. * * * (Yes. Right.)" P. 309.[1]

The above question, addressed to his 'Brother Charles,' obviously implies that their mother is 'in the spirit.' The rest follows as a matter of course. Again—

"Do you remember McCollum [?] (S.: McAllum?) (R. H.: McCollum?) (S. to R. H.: No. I know what it is.)

"(Spell it again.) McAllum. (How was he related to you?) [Sic!] He was McAllan [?]. (Yes, that's it.) Don't you U D who I mean? He came over some time ago. [Correct, if it refers to my cousin.—J. H. H.] (Yes. I remember. Tell.)"—(P. 422.)

The 'communicator' resumes, after speaking of other matters.

"Yes, and McAllan. Well, you must know him. I had a cousin by that name. * * * [He was my cousin, not father's.—J. H. H.]" (P. 423.)

At the end of the sitting Professor Hyslop mentions the true name McClellan and it is interesting to know that in the next sitting the name is spelt almost correctly, viz., 'McLellen.' Also (p. 427), "I am your cousin H. H. McAllen." (Real name R. H. McClellan.)

The simple assertion that "at the end of the second sitting the name and relationship of my father was given as Mrs. Piper came out of the trance" is hardly a fair statement in view of the recorded facts:—

"[Mrs. P., as she was coming out of the trance, began to utter a name. I recognized this as 'Hyslop' twice before Dr. Hodgson, and deliberately refused to say so with the hope that he would recognize it also. * * * But as soon as I indicated what she was trying to say, doing this first by asking him, 'Don't you hear what she is trying to say?' and then saying to him 'Hyslop' (short sound of 'y'), he saw and assented at once, and Mrs. P. then pronounced the name much more distinctly. * * *]"—(P. 322.)

The author writes:

"His own name and mine were correctly given and it was he who first mentioned Robert and eventually Frank and Hettie as among his

[1] In the printed records, the utterances of the 'sitter' are put into parenthesis, comments and explanations into square brackets. 'S.' stands for 'sitter,' *i. e.*, Dr. Hyslop.

children. I mentioned George myself first (with the intention of misleading the communicator), and other communicators mentioned the rest of the children, Margaret, Sarah, Annie, Charles, Will and Lida before my father did so. The distinction was correctly indicated in all of these names between the living and the dead." (P. 86.)

This sounds very convincing. But one's conviction is shaken by passages such as the following:

"Now I have not spoken of Abbie yet. * * * (Abbie is not quite right.)

"Addie, no, did you say no? (That is not quite right.) [Repeated.]

"A * * * Nabbie. (R. H.: is that *Nabbie?*)

"A b sounds like Abbie, is it Addie?

"(What relation is that to me?) She is his sister.

"(Do you mean *Annie?*) *No.*

"(Oh, well, I know. I know who you mean now. Yes, I know who you mean now. But it is not spelled quite right.)

"He seems to say * * * let me hear for you Rector. [Apparently by G. P.]

"H Abbie. (The letter H is right.)

"Yes, but let me hear it and I will get it.—G. P.

"Hattie. (That is very nearly right.) Harriet.

"(Pretty nearly. Try it one letter at a time.)

"H E T T I E. G. P. (That is right. Yes. That is right and fine.)

"Ett [?] Hettie.—G. P. [Cf. 'McLellen G. P.' P. 429.]

"Yes, do you hear it, James? (Yes. I hear it.)"

This sister's name was Henrietta though she was never called 'Hettie' by the family as far as the writer knows.—(P. 434.)

It is fortunate, indeed, that the complete records are acccessible to the reader, for passages like the above arouse some mistrust of the author's competence to interpret them fairly. At times, indeed, he seems to have thrown scientific caution completely to the winds. The description of his death by his father's alleged spirit is characterized as 'one of the most remarkable though confused messages in the record'!

"Oh, yes. I hear. I hear you. Yes. I know now. Yes, my stomach.

"(S.: Yes. Was there anything else the matter?)

"Yes. Stomach, liver. (R. H.: Liver?)

"He says and head.

"(S.: Very well. Tell all about it.)

"He has taken off this condition, but tells me he could not see clearly. What was meant by his eyes? His stomach and * * *

"Speak plainly. * * * [To invisible.] I do not get it.

"Sounds like Bone [?] (R. H.: Can't read that.)

"(S.: Is that *bone?*) Bone [?] Bone [?] he * * * he is telling me. Wait.

"He places his hand over his * * * heart beat [?]

"(S.: Heart?)

"Yes, let me reach thee [not read] reach thee, friend.

"[Hand moves over R. H.'s head.]

"Think I am finding it hard to breathe * * * my heart, James * * * my heart, James * * * difficult to breathe.

"Do you not remember how I used to breathe? (S.: Yes, father, you are on the right line now.)

"Yes, I think it was my heart which troubled me most. * * * I * * * and my lung. * * *

"Stomach and heart. I felt a [undec.] and tightness of my chest * * * and my heart failed me. He says distressed in the region of the heart, but at last I went to sleep. Was it not congestion, James?

"(S.: Not that I know of.) [I had the catarrh in mind in this answer. I should have had the death scene in view. (November 3, 1899.)—J. H. H.]"—(Pp. 327–328.)

'Remarkable' this truly is in view of Professor Hyslop's statement (p. 26) that his father died of 'something like cancer of the larynx.'

A growing tendency on the author's part to adjust his facts to his theories at any cost becomes evident when we compare his earlier and later notes upon the same incidents. Whereas in the former due skepticism is commonly observed, in the latter the veracity of the 'communications' is saved by the most strained and unnatural interpretations. It is truly amazing with what ingenuity the author inverts and rearranges some of these utterances so that they may conform to fact. For instance, during the sittings conducted by Dr. Hodgson in Professor Hyslop's absence, statements are freely made by 'communicators' which appear to any unprejudiced reader to be the grossest fabrications. Such, for example, is the remark by the alleged 'father'—"I am thinking of the time some years ago when I went into the mountains for a change with him, and the trip we had to the lake after we left the camp." (P. 371.)

Of this the author himself writes in an earlier note: "It would require a great deal of twisting and forced interpretation to discover any truth in the statements for any one in the acquaintance of my father, even if it could be done in any way at all. It might suggest something to others, but it suggests only what is false to me." (P. 371.)

In a note added later, however, he propounds a most astounding hypothesis, accounting for the mistakes by a failure of 'Rector' (the 'control' who usually acted as amanuensis) to properly hear the message as dictated by the 'spirit.' "In order that the reader may see how nearly the passage is to being absolutely correct I may be allowed to reconstruct it somewhat with the imaginary confusion that ends in 'mountains' and 'camp.' If we assume anything like the trouble that was manifest in the guitar incident (cf. p. 461) the following is conceivable. 'I am thinking of the time some years ago when I went into [Father says 'Illinois.' Rector does not understand this, and asks if he means 'hilly.' Father says, 'no'! 'prairies.' Rector does not understand. Father says, 'no mountains.' Rector understands this as 'No! Mountains,' and continues] the mountains for a change with him, and the trip we had to the lake after we left [Father says, 'Champaign.' Rector understands 'camp,' and continues] the camp.'" (P. 409.)

And in reference to a mention of the name 'Bartlett' (no such person being known by the 'spirit' during life) the author's suggestion is that his father might be referring to *Bartlow* Township where one of his sons lived, or possibly to 'Bartlett pears of which father was very fond'!!

Such evidences of extreme bias may seem to many readers to quite discredit the value of Professor Hyslop's work in this field. And I cannot but think, with regret, that the publication of this Report may weaken, rather than further the cause of psychical research. However, after making full allowance for credulity and lack of caution on the author's part, it seems to me that he has added considerable to the already strong evidence in favor of the 'supernormal' character of the Piper phenomena. Whatever we may conceive the process to be by which the knowledge is obtained by the medium, many of us, with Professor James, 'cannot resist the conviction that knowledge appears which she has never gained by the ordinary waking use of her eyes and ears and wits.' There are numerous instances in Professor Hyslop's record of correct statements of fact given by 'communicators,' which it is very hard to attribute to fraud, suggestion or mere coincidence. A few such cases might be profitably cited.

The reference by the *soi disant* spirit of Professor Hyslop's father to *putting an organ into the church*, in reply to the remark by his son 'you will remember Harper Crawford, I think' (pp. 491–492), is certainly remarkable, in view of the facts of the case. This Harper Crawford was one of three persons who had left the church which Mr. Hyslop had attended, owing to the introduction of an organ, they having religious scruples against the use of instrumental music during worship. Dr. Hyslop did not know of these facts at the time of receiving the 'communication,' though it is not certain that he had not heard of them at the time. An examination of the previous records show no possible suggestions or clues which the medium could have used in this case.

Another instance—Professor Hyslop learns on May 16th that a family connection of his, named John McClellan, had died on the 30th of March, 1900. Being in New York at the time, he wrote to Dr. Hodgson, who was then conducting a series of sittings on his behalf, asking him to inquire at the sitting of June 4th if his (Hyslop's) father 'had any knowledge of anything recent to tell me.' Dr. Hodgson himself was not informed of the facts. The reply (not immediately given) is—

"And Mr. McClellan has come over to me and * * * splendidly * * * he is delighted with the change,[1] per * * * (Yes. *Which* McClellan?) John * * *" It was stated also that he was brother of 'James' McClellan and either 'uncle' or 'great-uncle' to James Hyslop. James McClellan was Hyslop's uncle by marriage; his brother John was the one that actually died on the date mentioned. Their father was also named John; hence, perhaps, the confusion between 'uncle' and 'great-uncle.' (Pp. 471, 472, 473.)

On one occasion the 'father,' who had enumerated at various times most of the members of the family, asks:

"Have I overlooked any one, James? * * * (Yes, you have overlooked one * * *)." (P. 441.)

In a later sitting, an 'uncle,' after discussing other matters, suddenly introduces the name 'Lida.' The following dialogue ensues:

"(Yes, I remember Lida. What relation is she to me?)

"Annie and she are cousins, Lida Aunt. (Yes, which Annie is cousin of her?) There is a sister Annie and a cousin Annie and Aunt Lida. She was an aunt to James Hyslop, if I remember rightly, and there is a sister in the body by that name. (Yes. Yes.)" pp. 459–460.

[1] This recalls 'Phinuit's' statement that 'It's a damn sight better here.'

The 'father' at this point interposes with the remark: "Which is the one I failed to mention."

The facts are these: Dr. Hyslop has a sister called 'Lida'; his aunt after whom his sister was named was called 'Eliza'; his uncle always abbreviated the name to 'Liza.'

In explanation of these phenomena, Professor Hyslop adopts unreservedly the spiritistic hypothesis. It is not likely that his arguments will convince any one who is not already prepared to accept this view. They are in part positive arguments for the spiritistic theory, in part objections to the alternative theory of telepathy. Some of these latter are certainly full of force. The evidence of some of the present records, and more yet of certain previous ones, goes to show that if telepathy occurs at all in this case, it must occur not only between the mind of the medium and that of the sitter present, but between the mind of the medium and that of some distant person who may be quite unknown to her. Of this supposition the author writes:

"To state it as boldly and clearly as is possible, it involves the power of the medium, wholly unconscious and not knowing the sitter, as any condition of establishing rapport at any distance, to select any absolutely unknown person necessary, anywhere in the world, and from his memory make the selection of pertinent facts to represent the personal identity, as that selection has been described for the mind of the sitter"!!(p. 139), and elsewhere:

"We may well halt before asserting or assuming such an omniscient power. * * * We may well ask, in reply, whether such a conception is not convertible with pantheism, or that form of monism that conceives all phenomena whatsoever, present, past and future, as modes of the absolute, a conception which I must consider as equivalent to spiritism, because we can as well postulate the continuance of each set of facts in this way as in the form of individualization usually imagined in the 'spiritual body' or immaterial soul." (Pp. 133 and 134.)

Against the often suggested analogy between telepathy and electrical induction, and especially the comparison with wireless telegraphy, he says:

"As a more conclusive objection to both this assumed analogy and to telepathy itself without that analogy, I may refer to the universal law of the distribution of energy in the physical world. This law is that force varies inversely with the distance; the ratio may be the square, cube or other power. This makes it possible to assign definite limits to the perceptible influence of such forces. * * * Her facts

are *selected* pertinently to her object without regard to space limitations, or the laws for the propagation of physical energy. Nobody seems to have any influence upon her 'subliminal' but the right person in the world, and that person unknown to her." (Pp. 140, 141.)

Certain positive arguments brought forward by the author for the spiritistic hypothesis are:

"(1) The unity of consciousness exhibited by the communicators, or the satisfaction of the criterion for personal identity. (2) The dramatic play of personality. (3) The mistakes and confusions. (4) Certain mechanical and coincidental features in the automatic writing of the medium." (P. 158.)

Regarding this 'unity of consciousness' he says:

"The whole organization of the synthesis is independent of the mind of the sitter, as they are not wholes of his past personal experience in the form in which they are presented as messages, but would have to be selected individually as elements and interwoven into the accurate true incidents that they are by a power which is infinitely vaster than anything we know in the physiology and psychology of both normal and abnormal phenomena." (Pp. 175, 176.)

The 'dramatic play of personality' is certainly a most interesting and striking feature of the case, even to those who believe, as most psychologists will, that we have to do at the most with phenomena of secondary personality. The coming and going of the various *dramatis personæ*, the faithfulness with which each adheres to his own part, never confusing his rôle with that of another, and the general, though not universal, consistency and lack of contradiction throughout the whole piece is certainly impressive. Though in general the various 'spirits' address the sitter, they occasionally engage in what Professor Hyslop calls 'transcendental conversations' among themselves, the record of such dialogues appearing, however, on the paper. A passage which admirably illustrates this dramatic character of the records, as well as the not infrequent humorous touches, is that relating to the name of Professor Hyslop's stepmother. The latter was always called in life 'Maggie,' her name being Margaret. The 'father' in these communications frequently mentions an 'Annie,' seeming to refer to this stepmother. Hyslop tries to get the true name stated but without success. He finally appeals to 'G. P.' who promises to get it for him. Much later in the sitting the following interruption occurs:

"I will speak for a moment, and say I do not see any reason for anxiety about Margaret. [Correct name of my stepmother.—J. H. H.]

"(R. H.: Who says this?) George.

"(S.: Margaret is right. The rest of it. Margaret is right. Can you tell the rest, George?)

"He said I suppose I might just as well tell you first as last and have done with it, or James may think I do not really know. Go tell him this for me. You see I got it out of him for you, H., but you no need to get nervous about it, old chap." (P. 486.)

It seems probable that Professor Hyslop has underestimated the histrionic possibilities of the secondary personality. The faithfulness with which a hypnotic subject will adhere to an imaginary rôle makes it at least credible that the trance consciousness, or consciousnesses, of the medium, evidently striving to their utmost to achieve this result, might be capable of an even greater skill in simulation. And indeed the earlier records, under the 'Phinuit' régime, suggest an elaborate piece of acting.

The author's arguments which are based upon the enormity of the assumptions underlying the telepathic hypothesis are fully met by the observed cases of 'cross telepathy' described by Andrew Lang (*Proc. S. P. R.*, Vol. XV.) granting, of course, that the latter be trustworthy.

Decidedly the weakest part of Professor Hyslop's work is his attempt to meet the objections to the spiritistic hypothesis. He seems to have ignored the formidable array of difficulties presented by Mrs. Sidgwick (*Proc. S. P. R.*, Vol. XV.) based upon a study of this very case. It will surprise those who have read some of the extracts which I have cited from Dr. Hyslop's records to hear him declare that:

"The first thing to be said in regard to the difficulties and objections to the spiritistic theory is that, from the standpoint of my own sittings alone, there are no serious obstacles to the doctrine. If I had to judge the case by my own experiments and record alone, I do not see how I could avoid the conclusion that a future life is absolutely demonstrated by them." (P. 242.)

It is true that some of the most cogent objections to the theory are based upon previous reports of the Society. But an abundance of facts are to be gathered from the records of Professor Hyslop's own studies that will certainly strike the unprejudiced reader as being 'serious obstacles.' During Dr. Hyslop's absence, Dr. Hodgson made a very clear statement to the alleged spirit of the former's father, describing the conditions of the sittings and the purposes of the experiment. The 'spirit' expressed his entire appreciation of the situation, and promised to do as well as his memory would permit in complying

with the tests. In spite of these promises, the subsequent statements are as confused and as far from the truth as before. The anecdotes recalled by the 'father' as especially good 'tests' are not verified by Professor Hyslop upon inquiry of members of his family who ought to have known. The case recalls that of 'Hannah Wilde's' letter, as cited by Professor James (*Proc. S. P. R.*, Vol. VI.) and by Dr. Hodgson (Vol. VIII.), and that of the names of Stainton Moses' 'controls,' as narrated by Professor Newbold (Vol. XIV.). In these latter cases, the alleged 'spirits' made long circumstantial statements about matters of fact with which they ought to have been quite familiar, but their accounts proved to be complete fabrications.

Again, expressions are freely used by 'communicators' which were not in the least characteristic of the persons when living. Professor Hyslop's 'father' uses the word 'Sunday' in place of 'Sabbath,' contrary to a lifelong habit; he also refers to his sitting-room as his 'library,' his carriage as his 'coach,' and makes mention of his 'diary,' a thing which, in reality, he never kept.

But it is when we look into some of the previous records of the Piper case that we meet with the most insuperable objections to the theory which Professor Hyslop defends. It is quite conceivable that a man's near relatives and friends should send him messages, providing that a way were opened, but what shall we say of the appearance upon the scene of Mrs. Siddons, Sebastian Bach, Commodore Vanderbilt, Ulysses, Homer and *Adam Bede?* None of the spirits have presented better credentials than 'George Pelham.' If his identity be disproved, the evidence for that of no other spirit can be said to have much weight. And yet this very George Pelham vouches for the identity of 'Phinuit,' although the latter gave most contradictory accounts of himself, and he even corroborates the contention of 'Doctor' that he is Homer![1] What can be said of George Pelham himself under the circumstances? And how are we to explain the appearance of the 'spirit' of the author of a manuscript which was presented to Mrs. Piper during her trance, when the author himself was alive and well? Objections of equal force might be multiplied almost indefinitely.

Many of these objections are not considered at all by Dr. Hyslop. The others are met by resorting to such assumptions as, firstly, that

[1] Of the chief among Mrs. Piper's present 'controls,' Professor Hyslop remarks: "Imperator's temper represents, in its philanthropic sympathy for man, as nearly as anything I know, the character and purposes of Jesus Christ." (P. 181.) It is incredible that he really means what the reader might easily infer from these words.

serious difficulties exist in the way of communication through the medium; and, secondly, that the 'communicator' himself is not in a normal mental condition at the time, being in something like a dream consciousness during the process of communicating. To all objections based upon the incredibility of spirits existing under such conditions as they sometimes describe for themselves, he replies with the assertion of our complete ignorance of the conditions of a discarnate existence, and the consequent injustice of judging the case by any preconceived standards. We doubt whether Professor Hyslop himself is really satisfied with such a disposition of the numerous glaring absurdities contained in the accounts we get of the 'other side.'

We should certainly avoid some enormous difficulties if we could assume that in the Piper case we had to do with an exceedingly complex instance of multiple personality, each phase of which was convinced of its identity with the individual it purported to be, and acted its part accordingly. The information given is certainly derived in great part from suggestions received from the sitter, these being seized upon, apparently, by an abnormally keen perception and stored away by an abnormally tenacious memory. But there is a considerable residuum of facts that it seems very difficult to explain without invoking some supernormal faculty as yet very little understood. To call this 'telepathy' or 'clairvoyance' or by some other name would not help us to a solution. Words are not explanations. We await more data.

FRANCIS B. SUMNER.

COLLEGE OF THE CITY OF NEW YORK.

It seems desirable to publish in the REVIEW a somewhat detailed examination of the last part of the *Proceedings of the Society for Psychical Research*, and it seems best that it should be prepared by an author taking a sympathetic attitude toward the phenomena with which the Society is concerned. It should not, however, be assumed that this attitude is shared by the editors of the REVIEW. The phenomena are apparently not such as can be treated by scientific methods, and each must form an individual opinion. The undersigned believes that the facts reported do not require or justify the assumption of the supernormal as a working hypothesis. Neither does he regard the phenomena as suited to scientific investigation until the possibility of fraud has been excluded.

J. MCKEEN CATTELL.

ASSOCIATION.

Experimentelle Untersuchungen zur Associationslehre. FRIEDRICH SCHMIDT. (Aus dem psychologischen Institut der Universität Würzburg.) Zeitschr. f. Psychol. u. Physiol. d. Sinnesorgane, Bd. 28, Heft 2, pp. 65–95 (1902).

This research was suggested by, as it is a further elaboration and criticism of similar investigations by Thumb and Marbe ('Experimentelle Untersuchungen über die Psychologischen Grundlagen der Sprachlichen Analogiebildung,' Leipzig, 1901). The subjects of the experiment were children, from the 'Würzburger Stadtschule,' who had not yet been drilled on the grammatical paradigms.

The words were called out to the children and the answers (first associations) and the time recorded. Both verbs and adjectives were used. In general, Marbe's law was confirmed, that the reaction is quicker in direct ratio to the familiarity of the words associated, but Schmidt did not find Marbe's other law confirmed, that the average time of the larger groups of identical reactions was shorter than the average time of the smaller groups.

The order of preference in associations, in the case of verbs, he found to be: (1) Some form of the same verb or of some other verb, (2) substantives, (3) adjectives, (4) other parts of speech. This agrees with the results of Thumb and Marbe except that (1) and (2) are reversed. This difference, as well as the difference between the results of his own researches and those of his predecessors in the case of adjectives, Schmidt lays to the slightly different methods employed.

Ten tables set forth the results of the investigation in an instructive way, but many more investigations will have to be carried out along this line before the author's hope will be justified that this sort of inquiry will be of much value to the philologist.

An interesting part of the research is the comparison made between the different types of 'gegenseitige Reactionen' in the case of both verbs and adjectives, and especially the strong tendency in certain subjects to construct unusual antithetic adjectives such as *unzukünftig*, *unvoll*, *unewig*, etc.

H. HEATH BAWDEN.

VASSAR COLLEGE.

THE PERCEPTION OF SPACE.

Zum Problem der Grundlegung der Tiefenwahrnehmung. A. KIRSCHMANN. Philosophische Studien, XVIII., 114.

This paper is an attempt to substantiate the theory propounded by the author in 1894 in the same journal under the title: 'Die Paral-

laxe des indirecten Sehens und die spaltförmigen Pupillen der Katze.' The occasion for this substantiation is to be found in an article by R. Müller, published in the *Studien* for 1898, in which the theory of Kirschmann is unfavorably treated on both theoretical and experimental grounds. Let us briefly recall the chief points under discussion.

From a consideration of the geometrical factors involved in vision, Kirschmann showed that the retinal images of points lying at different distances and seen in indirect vision must undergo peculiar shiftings whenever there are changes of accommodation or movements of the eye in its socket. In the first place the images keep their position relative to one another, but shift towards or away from the fovea, according as the accommodation changes for a nearer or a more remote point. In the second case the images undergo displacement relative to one another, coming together or moving asunder as the point of regard approaches or recedes from the objective points in question.

Now it is just these shiftings of images on the excentric parts of the retina, so Kirschmann claims, that give to *monocular* vision an extremely important factor in the perception of depth. To be sure, they are not consciously noticed, but no more are ordinary double images which exist unseen for perhaps the majority of individuals, though they are the indispensable condition of stereoscopic vision.

This theoretical deduction was supported in the main by two lines of argument. First, the theory explains clearly why changes in the size of the pupil accompany changes of accommodation and convergence. This is not a question of the amount of light admitted to the eye, but rather a question of the sharpness of the images upon the outlying parts of the retina. For these images, coming as they do from objects at varying distances, are really dispersion circles—projections, that is, of the pupil upon the retina. In the interests of clear monocular perception of depth, then—and such perceptions must and do take place in the lower and outer portions of the field of view—these dispersion circles must be as sharply defined as possible, a condition that is secured by a contracted pupil. And since, further, the parallax of indirect vision is effective for the near ranges of vision only, convergence and accommodation for near objects must be accompanied by a narrowing of the pupil. In the second place, the slit-like pupil of the cat is accounted for by similar considerations. For the crouching mode of hunting requires that the perceptions of relative depth made in indirect vision be exact along the longitudinal meridian only. This is secured by a pupil narrowing to a vertical slit.

R. Müller pretends to bring the above theory to an experimental test. He also urges objections of various sorts. It is with these experiments and criticisms that the article before us is concerned. As to the former, Kirschmann easily shows that they are entirely irrelevant to his own claim, since they are concerned wholly with the capacity to establish an equality of distance between a point seen monocularly in indirect vision and the point of fixation. To be relevant to the author's theory they should have investigated the ability to perceive the relative distances of objects in the lower lateral parts of the field of view and at distances within the reach of the hand.

The author admits very freely that in his opinion his hypothesis is not accessible to direct empirical proof, since the factors involved can hardly be brought to the focus of attention. Still indirect proofs are not wanting. Two of these have been mentioned above as discussed in the article of 1894. A third, to which attention is here again directed, is to be found in the author's article : 'Der Metallglanz und die Parallaxe des indirecten Sehens,' published in the *Studien* in 1895.

As to Müller's theoretical criticisms, the main one is that the magnitudes concerned in the parallax of indirect vision are too insignificant to form the basis for perceptions. This objection had been anticipated by Kirschmann in his first article, and a table of calculations was there given which showed that even under the most unfavorable conditions the values assigned to the parallax could not be looked upon as imperceptible. To strengthen this claim and remove the edge from the objections mentioned the author describes some interesting new experiments involving chromatic aberration. Colored lines and figures on dark or light backgrounds, as the case may be, are viewed binocularly through a large reading-glass. The refraction is too slight to cause a blurring of the lines at the edge of the field, yet it is great enough to make itself felt in marked depth displacements in the figures. If a dark background be used, red and blue are the best colors to use. In this case the red lines advance into the foreground. With a light background blue and yellow give the most striking results. When these are seen through the lens it is the blue that approaches the observer. With these results before one, the author thinks that no one should any longer hesitate to accept his hypothesis for the reason that it deals with insignificant magnitudes.

A. H. Pierce.

Smith College.

HEARING.

L'Audition. PIERRE BONNIER. Paris, O. Doin. 1901. Pp. 276.

This volume forms part of the 'Bibliothèque Internationale de Psychologie Expérimentale,' edited by M. Toulouse. The subjects treated are as follows: The evolution of the ear is sketched in an illustrated chapter. The author denies a sense of hearing proper in invertebrates and fishes, that is to say, in all animals not possessing a cochlea. The function of the more primitive 'ears' is the perception of pressure and of oscillatory variations in the surrounding fluid medium, or of the trembling of solid objects. The anatomy of the human ear is presented in a series of excellent figures. Physiology is represented by an extended discussion of the different theories regarding the action of the cochlea in the reception of sound-waves. The author rejects Helmholtz's theory and all similar theories, and defends one already advanced by himself, which differs from the rest in denying that the fibers of the basilar membrane, or any other cochlear structure, act as resonators and vibrate sympathetically and separately with sounds of different pitch. His objections to the theory of resonators are: first, that no organs exist in the inner ear that are large enough to vibrate in unison with low tones, or with any but the highest audible tones; and, second, that the difference between the largest and smallest supposed resonators is by no means proportional to the difference between the wave-lengths of high and low tones. According to the author's theory, every element of the cochlea is capable of stimulation by waves of any length. The multiplicity of elements, since many of them will be stimulated almost but not quite simultaneously by a given lymph-wave, serves to convert a vibratory movement of the lymph into a continuous activity of the auditory nerve, and so gives rise to the continuous sensation of sound. Another part of the author's theory is that the movements of the solids and liquids of the inner ear are molar, not molecular vibrations. The movement impressed by the stapes on the perilymph of the vestibule travels by the shortest route, through the membranes, to the round window. In depressing the basilar membrane, it pulls on the hair processes of the cells of Corti and stimulates the nerve-ends.

The more strictly psychological topics treated comprise:

The perception of *timbre*. This does not consist in an analysis of a tone into its fundamental and harmonics; what is heard is not the component vibrations, but the resulting *form* of the total vibration.

The localization of sound: The author draws a sharp distinction between the feeling of the direction of sound, which is present in mon-

aural hearing, and the feeling of auditory depth or distance, for which the basis is provided by the different impressions made by a sounding body on the two ears.

The theory of music: This is very briefly treated. A sound is disagreeable if it is so complicated as to require great effort for its appreciation. The 'law of least effort' applies here as in other realms of æsthetics. The degree of effort attending the appreciation of a sound does not depend entirely, however, on the complexity of that sound alone, but also on the preparation that has been made for it by immediately preceding sounds. The musical scale has been built up on the principle of easy passage from one note to another. There is need in music, as in other forms of æsthetic attention, of frequent periods of relaxation, *i. e.*, in the present case, of frequent modulation from complicated chords to simple ones.

The clinical side of the subject is represented by a discussion of the different methods in vogue for measuring the acuity of hearing, by an untechnical account of the causes of deafness and other disturbances of hearing, and by a chapter on the early diagnosis of progressive deafness.

The author has confined his book to subjects in which he has himself been an investigator. Hence a certain freshness, and also a certain controversial air in his style of treatment. Hence, also, the book is by no means cyclopedic in scope.

R. S. Woodworth.

University and Bellevue Hospital Medical College.

SLEEP.

The Necessity for a New Standpoint in Sleep Theories. Henry Hubbard Foster. The American Journal of Psychology, Vol. XII., 2, January, 1901.

This is a useful résumé, accompanied by a criticism, of the various and sundry theories of sleep, to which are added some suggestions upon future lines of inquiry. Of the *circulation* theories, we have the old 'brain congestion' theory, the more modern 'brain anæmia' theory of Durham, Hammond, Howell and others, and certain recent theories of cortical anæmia with hyperæmia at the base of the brain. Future theories must reckon with the fact of at least cortical anæmia, but will probably regard it as a symptom and not the cause of sleep. The *chemical* theories are divided into the combustion theories and the auto-intoxication theories. As regards the first, the author thinks it unwarranted to attribute sleep, as Pflüger does, to decrease in gaseous exchange. As regards the presence of decomposition products in the

blood or cerebral centers, it is dogmatic to refer sleep to any particular toxic agents. Nevertheless, 'if the ultimate explanation of the phenomena of sleep is to be found anywhere, it must be sought in the chemical composition and the chemical changes occurring in the nerve cell.' Lastly come the *histological* theories, particularly those referring sleep to the partial paralysis of the amœboid prolongations of the neurocytes resulting in an isolation of the nerve elements.

The 'new standpoint' which the author urges is the evolutionary. Regarding sleep as the cessation of consciousness, we must inquire under what conditions consciousness has arisen in complex organisms. Such a study will show that the physiological conditions necessary to the support of consciousness will necessarily suffer periodic collapse due to fatigue, limitation of capacity, rhythmic habit, etc.

Although the author is working upon a somewhat different problem from that of the writers whom he reviews, still it is no doubt true that this broader standpoint would have saved some confusion in the discussion of the *causes* of sleep. A bibliography is appended.

G. T. W. PATRICK.

UNIVERSITY OF IOWA.

NEW BOOKS.

Neurological Technique. I. HARDESTY. Introduction by H. H. DONALDSON. Chicago, The University Press. 1902. Pp. xii + 183.

An exposition of various methods of 'preparation and study of vertebrate nervous tissues.' It contains also a valuable detailed list of anatomical terms, 'Anatomical Nomenclature for the Nervous System and Sense-Organs.'

Der Æsthetische Genuss. K. GROOS. Giessen, Ricker'sche Verlag. 1902. Pp. viii + 263.

The Philosophy of Conduct. G. T. LADD. New York, Scribners. 1902. Pp. xxii + 663. $3.50.

Psychologie du Rire. L. DUGAS. Paris, Alcan. 1902. Pp. 178. Fr. 2.50.

La Logique chez l'Enfant et sa Culture. F. QUEYRAT. Paris, Alcan. 1902. Pp. 156. Fr. 2.50.

Fragments in Philosophy and Science, being Collected Essays and Addresses. JAMES MARK BALDWIN. New York, Charles Scribner's Sons. 1902. Pp. xii + 389. $2.50.

Les Caractères. FR. PAULHAN. 2me Ed. 1902. Paris, Alcan. 1902. Fr. 5.

Differs from the first edition mainly by the addition of a long new preface in which the author answers objections to his views.

Analytical Psychology. LIGHTNER WITMER. Boston, Ginn & Co. 1902. Pp. xvii + 251.

Psychologie Économique. G. TARDE. 2 vols. Paris, Alcan. 1902. Pp. 446 and 384. Fr. 15 each vol.

Psychologie du Délire dans les Troubles psychopathiques. N. VASCHIDE and VURPAS. Paris, Masson. No date. Pp. 191.

Saint Anselme. DOMET DE VORGES. Paris, Alcan. 1901. Pp. vi + 334. Fr. 5.

A Syllabus of Psychology. H. HEATH BAWDEN. Vassar College, Poughkeepsie, N. Y. 1902. Pp. 109.

Gehirn und Seelenleben. TH. ZIEHEN. Leipzig, Barth. 1902. Pp. 66. M. 1.50.

Mental Growth and Control. NATHAN OPPENHEIM, M.D. New York, The Macmillan Co. 1902. Pp. vii + 296.

Dr. Oppenheim states some of the elementary facts about the structure of the nervous system, attention, association, instinct, memory, habit, suggestion, imagination, the emotions, reasoning and voluntary action, adds some personal opinions of his own concerning the nature of mental functions and uses both as the basis of earnest exhortations to the young to improve their mental efficiency. The book is not intended for academic use and is of no especial significance to investigators or teachers of psychology.

Der Hypnotismus. L. LOEWENFELD. Wiesbaden, Bergmann. 1901. Pp. 522. M. 889.

An extended, clear, judicious, and admirable presentation of the subject of hypnosis and suggestion, intended as a hand-book. It is written with especial reference to the meaning of suggestion for the subjects of medicine and law. It contains an adequate historical chapter and a classified bibliographical list — which last, however, might be considerably extended, especially by the addition of the titles in English. The book is possibly the best résumé we have to date and an English translation would be of service. J. M. B.

L'Année Biologique. YVES DELAGE. 5^{me} Année. 1899–1900. Paris, Schleicher Frères. Pp. lxxvi + 676.

This issue of this excellent annual covers two years and so endeavors to 'catch up.' It has the same admirable features as heretofore, nearly one-fourth being devoted to the 'mental functions.' The loss to the psychological department of the *Année*, through the death of Marillier, is very heavy. We understand that M. Philippe is to take a leading place in analyzing psychological works for the *Année* in the future. J. M. B.

Ueber die allgemeinen Beziehungen zwischen Gehirn und Seelenleben. TH. ZIEHEN. Leipzig, J. A. Barth. 1902. Pp. 66. Mk. 1.80.

Kant's Prolegomena to any Future Metaphysics. Edited in English by Dr. PAUL CARUS. Chicago, The Open Court Publishing Company. 1902. Pp. v + 284.

NOTES.

THE American Philosophical Association held its first meeting at Columbia University, New York City, on March 31 and April 1, 1902. For some years philosophical papers have been presented at a special session of the American Psychological Association, but the desirability of a special society has been for some time recognized, and this was formed at a conference held in New York last November. Professor J. E. Creighton, of Cornell University, was elected president, and Professor A. T. Ormond, of Princeton University, has now been elected his successor. The Association will meet next winter at Washington during Convocation Week with the American Psychological Association and other societies. The papers read at the recent meeting were as follows:

'Poetry and Philosophy': Dr. Ralph Barton Perry.

'Recent Criticism of the Philosophy of T. H. Green': Professor William Caldwell.

'The Æsthetic Element in Human Nature': Professor E. Hershey Sneath.

'Address of Welcome': President Nicholas Murray Butler.

'The Functional Theory of the Distinction between the Psychical and Physical': Professor H. Heath Bawden.

'The Atomic Self': Professor George Stuart Fullerton.

Address of the President. Subject, 'The Purposes of a Philosophical Association': Professor James Edwin Creighton.

Discussion on the Address: President Francis L. Patton.

'The Concept of the Negative': Dr. W. H. Sheldon.

'Being, Not-being and Becoming: a Study in the Logic of Early Greek Philosophy': Professor Alfred H. Lloyd.

'Aristotle's Theory of Reason': Professor William A. Hammond.

'On Final Causes': Dr. Edgar A. Singer, Jr.

'On the Study of Individuality': Professor J. A. Leighton.

'The Conciousness of Obligation': Professor E. B. McGilvary.

'Kant and Teleological Ethics': Professor Frank Thilly.

'Epistemology and Ethical Method': Dr. Albert Lefevre.

'The Epistemological Argument for Theism': Professor Edward H. Griffin.

'The Philosophy of Religion: Its Aim and Scope': Dr. F. C. French. (Read by title.)

PROFESSOR F. J. E. WOODBRIDGE, now head of the department of philosophy in the University of Minnesota, has been elected to a chair of philosophy at Columbia University in view of the election of Dr. Nicholas Murray Butler to the presidency. Dr. Butler retains the chair of philosophy and education, and offers two courses in philosophy next year. Professor Cattell has been made head of the department of philosophy and psychology.

DR. CHAS. H. JUDD, professor of psychology in the University of Cincinnati, has received a call to Yale University.

DR. FREDERICK W. COLGROVE has resigned the professorship of philosophy in the University of Washington, being seriously ill.

PROFESSOR JOSIAH ROYCE, professor of philosophy at Harvard University, and Professor J. Mark Baldwin, professor of psychology at Princeton University, will lecture before the summer school of the University of California during July.

PROFESSOR JAMES is at present abroad, in order to give his second course of Gifford lectures at Edinburgh University. Professor James and President Schurman have been given the LL. D. degree at Edinburgh.

DR. GWATKIN, professor of ecclesiastical history in the University of Cambridge, has been appointed to succeed Professor James as Gifford lecturer at Edinburgh; Professor Emile Boutroux, of the Sorbonne, has been elected Gifford lecturer in the University of Glasgow, in succession to the Master of Balliol.

DR. W. H. R. RIVERS, of Cambridge University, will shortly start on an expedition for the psychological study of the Todas of southern India on the lines of his work in Torres Straits.

PROFESSOR LEO KÖNIGSBERGER, of Heidelberg, is preparing an extended biography of Hermann von Helmholtz, which will be published by Friedrich Vieweg and Son.

IN view of the special attention paid to psychology at Clark University, it is of interest to note that the will of the late Jonas Clark has been settled, and that the University will receive $2,600,000.

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VII. Research Work in Genetic and Comparative Psychology. Consultations Professor Thorndike.

VIII. Analytic Psychology. Two hours weekly. Mr. Strong.

IX. Research Work in Analytic Psychology and the Philosophy of Mind. Consultations. Mr. Strong.

X. Diseases of the Mind and Nervous System. Lectures and demonstrations. One hour weekly. Professor Starr.

XI. Physiological Psychology. Three hours weekly. Professor Farrand.

XII. Abnormal and Pathological Psychology. One hour weekly. Professor Farrand.

XIII. Research Work in Physiological and Abnormal Psychology. Daily. Professor Farrand.

XIV. Aesthetics. Two hours weekly (and laboratory work). Dr. Jones.

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Further particulars will be found in the Announcement of the Division of Philosophy Psychology and Anthropology, which may be obtained from the Secretary of the University.

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III. PHILOSOPHY AND HISTORY OF PHILOSOPHY

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The University of Chicago

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